Small enterprise development in South Africa: an exploration of the constraints and job creation potential

by
Alfred Mbekezeli Mthimkhulu

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DECLARATION

By submitting this dissertation, I, Alfred Mbekezeli Mthimkhulu, declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated), and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Alfred M. Mthimkhulu 8 October 2014

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ABSTRACT

This thesis, presented in six thematic chapters, investigates an approach for promoting the growth of small businesses in South Africa. Chapter 1 motivates the thesis by discussing the contested role of small businesses in reducing unemployment and fostering social equity. Chapter 2 reviews the small business development policy in South Africa and explicates the socioeconomic conditions underpinning the policy. Chapters 3, 4 and 5 are empirical analyses using data from the World Bank Enterprise Surveys of 2003 and 2007, and the World Bank Financial Crisis Survey of 2010 to determine key impediments to the growth of small businesses and characteristics of firms creating and retaining most jobs in South Africa.

Chapter 3 uses two methods to investigate the key impediments. The first method is based on a count of obstacles that entrepreneurs rate as seriously affecting enterprise operations. The second estimates the effects of the obstacles on growth through sequential multivariate regressions and identifies binding constraints for different categories of firms. It emerges that medium-sized firms are mildly affected by most obstacles but micro and small firms are significantly affected by crime, electricity and transportation problems. The chapter provides important insight on the sequencing of interventions to address the impediments to growth.

Chapter 4 studies the finance constraint. It evaluates the importance of the constraint firstly by assessing whether firms rating finance as a serious problem underperform firms rating the problem as less important. Thereafter, the chapter studies the experiences of firms when seeking external finance and identifies four levels of the finance constraint. Using an ordered logit model and a binary logit model, the chapter explores the profile of financially constrained firms. Results show that firms owned by ethnic groups disadvantaged in the apartheid era are more likely to be credit-constrained. The results also suggest that the likelihood of being credit-constrained decreases with higher levels of formal education. The results inform policy on the types of firms that financial interventions must target.

Chapter 5 builds on a growing body of evidence which shows that a small proportion of firms in an economy account for over 50 percent of net new jobs. The evidence from the literature suggests that such high-growth enterprises have distinct characteristics that could make it possible for interventions to nurture or for other firms to emulate. The chapter employs two methods to investigate the characteristics of high-growth firms. The first is logit regression, which the investigation uses to determine characteristics of firms that create more jobs than the average firm. The characteristics are also interacted to identify interaction terms most associated with growth.

The second method is quantile regression, which makes it possible to assess the importance of each characteristic for firms in different levels of growth rates. The results show that the typical high-growth firm is more likely to be black-owned. The results of the chapter however highlight the need for further research into characteristics that may perhaps explain high-growth firms more robustly than variables in the survey instrument. The research ends with a summary, a discussion of areas of further research, and policy recommendations in Chapter 6.

Key Words: Micro, small and medium enterprises; job creation; high-growth firms; South Africa

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LIST OF ACRONYMS AND ABBREVIATIONS

BBBEE	Broad-Based Black Economic Empowerment
BRICS	Brazil, Russia, India, China, South Africa
CC	Credit Constrained
DTI	Department of Trade and Industry, South Africa
FCC	Fully Credit Constrained
G20	The Group of Twenty
GDP	Gross Domestic Product
GEM	Global Entrepreneurship Monitor
IFC	International Finance Corporation
MCC	Maybe Credit Constrained
MSMEs	Micro, Small and Medium Enterprises
NCC	Non Credit Constrained
NGOs	Non-Governmental Organisations
NPC	National Planning Commission
NPO	Not-for-Profit Organisation
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PCC	Partially Credit Constrained
SACCOs	Savings and Credit Cooperatives
SAMAF	South African Microfinance Apex Fund
SARB	South African Reserve Bank
SEDA	Small Enterprise Development Agency
SEFA	Small Enterprise Finance Agency
SMEs	Small and Medium Enterprises
WBES	World Bank Enterprise Surveys
WBFCS	World Bank Financial Crisis Survey
WDR	World Development Report

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

In countries with high levels of unemployment and social inequalities, government policies often emphasise the potential contribution of small businesses in addressing such socioeconomic challenges. But since governments have limited resources to attend to all possible issues impeding the growth of small businesses, there are some important empirical questions evoked by such policies. One such question is on the growth impediments that small businesses encounter in a given context, particularly what the most critical ones are and the extent to which they constrain growth. If this question is addressed, the limited resources can be used to attend to the most critical impediments. Given the high failure rate of small businesses, another important question concerns the characteristics of firms that survive, create and retain jobs. Specifically, what are the characteristics of firms that take on more employees than the generality of others? An understanding of such characteristics informs the design of interventions and whom such interventions must target for the socioeconomic challenges to be addressed. These empirical issues motivate the research for this thesis.

The thesis explores how support to Micro, Small and Medium Enterprises (MSMEs) could be designed to improve the socioeconomic circumstances of many in South Africa, especially by creating jobs. South Africa has had decades of high levels of unemployment that has averaged 23.5 percent since 1995 (South African Reserve Bank (SARB), 2014). The country also has high levels of social and income inequality, attributed mainly to the colonial and apartheid era policies that limited the majority of South Africans' participation in commercial activities and matters relating to national policy formulation. Since the end of apartheid in 1994, the government promotes MSMEs as the foremost strategy to integrate the society and to address the socioeconomic challenges evidenced by high levels of unemployment (National Planning Commission (NPC), 2011). A study on the South African MSME sector is therefore an invaluable contribution to the socioeconomic policy debates in South Africa and the empirical literature on enterprise development in emerging economies.

Although many studies, as reviewed by Rogerson (2008), have been conducted to inform government policy on how support to MSMEs could be improved in South Africa, lack of reliable firm-level data capturing enterprise performance over consecutive periods has meant that the impact that obstacles such as access to finance have on job creation and overall enterprise performance is speculative. Specifically, it is not clear which obstacles ought to be prioritised for policy interventions. It is also not clear which characteristics in firms and business owners the interventions must nurture for more jobs to be created. This thesis uses the World Bank Enterprise Surveys (WBES) of 2003 and 2007 and the World Bank Financial Crisis Survey (WBFCS) of 2010

to investigate the key obstacles to the growth of MSMEs and determine the characteristics of firms creating most jobs in South Africa.

The WBES provide comprehensive firm-level data that include obstacles firms encounter, jobs each firm created or lost, financial information about the firms as well as specific characteristics of the firms, managers and business owners. Most of the studies using the WBES are cross-country (for example Beck, Demirgüç-Kunt and Singer, 2013; Aterido, Hallward-Driemeier and Pages, 2011;Goedhuys and Sleuwaegen, 2010; and Ayyagari, Demirgüç-Kunt and Maksimovic, 2008). Cross-country studies include many countries in the analyses such that the resultant policy recommendations may not relate to specific circumstances prevailing in a country of interest such as South Africa.

Indeed, most cross-country studies recognise the limited relevance of their policy recommendations to individual countries analysed. For example, Ayyagari *et al*. (2008: 486) note that although controlling for country-fixed effects provides some useful country-level information on issues affecting enterprise growth, such information is 'not definitive' because start-ups and firm size distribution is influenced by business conditions in a particular country and is thus unique to a country. In-depth single country studies are thus essential for more appropriate policy recommendations since an in-depth single country study considers comprehensively the peculiar business conditions of the country and the unique firm size distribution such conditions have fostered.

1.2 MICRO, SMALL AND MEDIUM ENTERPRISES AND JOB CREATION

The policy question on how public incentives for job creation can be designed to target recipients who would create most jobs such that public funds are most effectively utilised is well-studied (Anderson, 1982; Birch, 1981; Winter, 1995; Rogerson, 2001; Holtz-Eakin, 2000; Nichter and Goldmark, 2009; Shane, 2009). The study by Birch (1981) however is important in that it highlights the challenges research and policy on small businesses must contend with. Birch (1981) observed that the main problem encountered by policymakers in designing effective policies was that it was not clear which enterprise types created most jobs. So Birch (1981) investigated the problem using data covering 80 percent of firms in the United States of America and concluded that two-thirds of new jobs between 1969 and 1976 "were created by firms with twenty or fewer employees, and about 80 percent were created by firms with 100 or fewer employees" (Birch 1981: 7). The findings by Birch (1981) prompted a debate on the importance of small businesses in job creation. This thesis is attentive to the resultant debate and how empirically and theoretically fragile the argument that small businesses deliver jobs is.

Methodological concerns, some of which Birch (1981) was upfront with in his report, were perhaps the first to emerge as basis to contest the findings. One concern is that the investigation did not

adequately deal with the high failure rate of small businesses, and another is the fact that some small businesses are subsidiaries of large firms, an issue not considered in the study (Davis, Haltiwanger and Schuh, 1994). A further concern is that the 'regression to the mean' problem was not dealt with in the study such that a small firm initially classified as a job-creator in the earlier years of the study period could be classified as a 'fast-shrinking large firm' in the later years of the study period if it reverted to its original size (Nightingale and Coad, 2013: 122). In spite of these concerns, however, Landström (2010) and Acs and Mueller (2008) among many others note that in Birch (1981), the 'conventional claims' (Davis *et al.,* 1994: 13) that small businesses create most jobs found empirical justification beyond the urge to appease the sheer numbers of small business owners to gain political votes (Thurik and Wennekers, 2004).

Studies subsequent to Birch (1981) provide mixed evidence on the importance of small businesses in reducing unemployment, with some researchers arguing strongly against public policy interventions for small businesses (Cowling and Siepel, 2013; Shane, 2009; Holtz-Eakin, 2000). One reason Shane (2009: 144-145) gives to demonstrate the wastefulness of broad-based programmes to support small business owners on the finding that "43 people have to try to start companies so that we can have 9 jobs a decade from now".

Indeed, Stel, Carree and Thurik (2005) used the Global Entrepreneurship Monitor (GEM) data and found that the effects of entrepreneurial activity on economic growth are positively associated with higher levels of Gross Domestic Product (GDP) *per capita* of a country such that countries with low *per capita* incomes may not grow or improve the lives of their citizens by promoting small businesses. But instead of concluding that entrepreneurship[1] must not be encouraged in developing countries, Stel *et al*. (2005: 318-319) argue that developing countries have few large firms from which knowledge can spill over to small-scale entrepreneurial activities. Without such knowledge and skills, the performance of entrepreneurial ventures is set to be mediocre resulting in limited socioeconomic development (Stel *et al.,* 2005; Wennekers, Stel, Thurik and Reynolds, 2005; Amorós, 2009).

On the other end of the debate is a strong commitment to support small businesses by public authorities globally. The commitment is expressed in reports such as the World Development Report (WDR, 2013) which identifies job creation through MSMEs as underpinning improvements in living standards, productivity and social cohesion and the G20 (Group of 20) report by the SMEs

[1] There is a debate in the literature on the appropriateness of the noun 'entrepreneur' being used in reference to owners of MSMEs (e.g. Amorós, 2009; Davidsson, 2004; Shane and Venkatarama, 2000; Baumol, 1990). In this thesis, 'business owner' rather than 'entrepreneur' is used except when the literature on entrepreneurship, especially that influenced by the GEM datasets, is being discussed.

Finance Group which surveyed programmes supporting Small and Medium Enterprises (SMEs)[2] in developing countries so as to determine the most effective programmes for scaling-up with the financial support of the G20 (G20, 2010). For policymakers the question is how to improve support to small and emerging firms and not whether small and emerging firms can create jobs, promote growth or improve living standards (Hallberg, 2000; Biggs, 2002).

There are further rationalisations that affirm the commitment of policymakers to supporting MSMEs. The rationalisations can be summarised from the more detailed discussions by Snodgrass and Biggs (1996), Beck, Demirgüç-Kunt and Levine (2005) and Green, Kirkpatrick and Murinde (2005) as follows. MSMEs enhance competition and boost innovation, which results in economy-wide efficiencies that are necessary for economic growth. MSMEs are in some cases more efficient and more productive than large firms, for example in serving niche markets that could be too small for large firms. However, MSMEs encounter more obstacles such as accessing finance to enable them to acquire better technologies to remain competitive. As a result, MSMEs are labour-intensive, affirming their importance in economies that have high levels of less skilled labour (Snodgrass and Biggs, 1996; Beck, Demirgüç-Kunt and Levine, 2005). It is further argued that because of their labour intensity, MSMEs are "more equitable in distributing the income that they generate" suggesting that MSMEs could be vital tools for engendering economic growth and social equity (Snodgrass and Biggs, 1996: 11).

In essence, the debate on whether or not small businesses must be supported on the basis of their job-creating capacity (where job creation represents a better livelihood as suggested by WDR (2013)) is unlikely to be settled. In fact, after reviewing the debate Hallberg (2000) concluded that the importance of small businesses is based on them being dominant private sector entities and accounting for most of the jobs in developing countries. Findings such as in Stel *et al.* (2005) and Amorós (2009) on preconditions necessary for small businesses to lead to economic growth are therefore quite important in buttressing the research agenda in developing countries. The challenge for policy and research in developing countries is in determining ways of improving conditions in which small businesses operate cognisant of the evidence that most of the MSMEs fold even when some of the obstacles to growth are addressed (Naudé, 2010; Amorós, 2009). Thus, over and above exploring the most serious obstacles as most of the research in developing countries does, it is important to understand the characteristics of firms that are consistent in creating jobs, hence this thesis discussion on the profile of such firms.

[2] In the thesis, the acronyms MSMEs and SMEs are not used interchangeably. The acronym SMEs excludes microenterprises and refers to small and medium enterprises, while MSMEs refers to micro, small and medium enterprises.

The debate in the empirical literature on small enterprise development triggered by Birch (1981) is on whether small businesses are to be supported on the rationalisation that they could improve living standards. But what is the theoretical basis for this empirical rationalisation? This is an important question because in a perfectly functioning market economy of profit or income maximising individuals (including the MSMEs), a firm whose products are well-received by the market should be able to expand if it continually innovates. Such a firm is able to retain its competitive advantage and market share (Shane and Venkatarama, 2000; Kirzner, 1999; 1997). A discussion on firm size is therefore difficult to envisage in a perfectly functioning market economy. However, the discussion on firm size arises when the market failure hypothesis is evoked. That markets have failed becomes the basis for justifying interventions to mitigate the failure (Haltiwanger, Jarmin and Miranda, 2013; Hall, Daneke and Lenox, 2010; Stiglitz, 1991; Anderson, 1982). By definition, market failure refers to a situation where allocation of resources by a well-functioning market mechanism is such that there are possible outcomes which yield better allocation of the available resources (Greenwald and Stiglitz, 1986; Bator, 1958). The challenge for policymakers is to identify the market failures and determine how they can be addressed (Stiglitz, 1991; Winston, 2006).

In small enterprise development literature, markets are presumed to have failed when small businesses have limited access to finance. Interventions such as credit guarantee schemes are implemented to operate within the normal well-functioning financial market to incentivise the market to lend to the small businesses that would otherwise not be considered without a guarantee from a third party. Similarly, microfinance institutions extend the reach of financial services without directly altering the operations of the financial market. Likewise, the market is presumed to have failed when executives of small businesses seem to consistently have poor business management skills. To mitigate the market failure, business development interventions are implemented to supplement the executives' limited formal education in accounting, management, marketing etc. Thus, interventions seek to complement existing formal market arrangements to improve the capacity of MSMEs to access production inputs and markets and ultimately create jobs (Audretsch and Thurik, 2000). The motivation of a significant body of empirical literature is to determine market failures present in a given context.

1.3 AN OVERVIEW OF EMPIRICAL LITERATURE

The literature can be categorised based on whether the focus is on one country, referred to as country-specific studies, or many countries, referred to as cross-country studies. Country-specific studies on MSMEs are often based on small surveys that raise concerns about the representativeness of the samples, authenticity of data, and dependability of resultant recommendations (Ayyagari, Beck and Demirgüç-Kunt, 2007). Such surveys also lack data from

consecutive periods, which makes it difficult for researchers to assess the real impact of problems that business owners report as impeding growth. Most studies on MSMEs in South Africa are based on small samples, are descriptive of challenges encountered by MSMEs, and review changes in the public institutional system for supporting small businesses (Rogerson, 2004; Lotz and Marais, 2007; Ladzani and van Vuuren, 2002; Rwigema and Karungu, 1999). A few studies however use larger samples drawn from national surveys (e.g. Naudé, Gries, Wood and Meintjies, 2008; Gumede, 2004; Visser, Coning and Smit, 2005). While small samples from a locality are useful in identifying key obstacles faced by MSMEs, it is perhaps necessary that such studies are complemented by more nationwide studies for the empirical literature to make a comprehensive contribution to policy formulation.

Two datasets have played an important role in mitigating the problem of lack of reliable data and unrepresentative samples on small business research in developing countries: GEM, which started in 2000, and the WBES, which started in 2002. Studies stemming from the two datasets have however been mainly cross-country in approach, leveraging on the large aggregated samples to employ cross-country regression in order to determine common characteristics of smaller businesses in the developing world. One of the key results from studies based on the two datasets, especially the WBES, is that access to finance is the most serious obstacle to the growth of MSMEs (Beck *et al*., 2013; Dihn, Mavridis and Nguyen, 2010; Ayyagari *et al*., 2008, Ayyagari *et al.* 2007).

Inasmuch as there seems to be consensus in the empirical literature that access to finance is the main obstacle to the growth of MSMEs, comprehensive studies of other obstacles at country level are necessary to ensure that interventions are directed at the most serious obstacles given the limited resources at the disposal of governments to address all obstacles at once (Rodrik, 2010; Ayyagari *et al.,* 2008). The GEM and WBES data facilitate country-specific studies but such studies remain sporadic in Africa such that the degree to which business environment obstacles constrain job creation by MSMEs is speculative. Some studies have used the GEM in South Africa. Naudé *et al.* (2008) used GEM data on South Africa and found that access to finance is a significant determinant of start-up rates. Gumede (2004) used the National Enterprise Survey of 1998 and found that access to finance significantly explains the propensity of small and medium enterprises to export. There are many studies using smaller samples in localities that show finance to be a key problem for MSMEs in South Africa (e.g. Netswera, 2010; Fatoki and Garwe 2010; Ladzani and Netswera, 2009; Naidoo and Hilton, 2006) but the relative importance or ordering of business obstacles based on the obstacles' effects on growth remains underexplored.

MSMEs are estimated to account for 57 percent of private sector jobs and 30 percent of GDP in South Africa (SEDA, 2012; DTI, 2005; Nieman, Hough and Nieuwenhuizen, 2003). But such statistics mask the lack of stability in jobs created by small businesses. Kerr, Wittenburg and Arrow

(2014) showed the lack of stability of jobs in the SME sector using quarterly employment data from Statistics South Africa. Kerr *et al.* (2014) found that on average in each quarter between 2005 and 2011, small businesses created 75 000 jobs but lost 110 000. The finding by Kerr *et al.* (2014) suggests that perhaps it does not suffice to merely identify obstacles to the growth of small business without demonstrating the possible existence of a segment of MSMEs that could be net job creators. If the goal of interventions for small businesses is job creation, it is necessary that there is some understanding of the profile of firms that are consistent job creators.

Public policy in South Africa underscores the important role of small businesses in social and economic development. MSMEs are seen as 'critical to broadening economic participation and job creation' (SEDA, 2013: 9). MSMEs are envisaged to contribute significantly to reducing the unemployment rate from 24 percent in 2013 to the target of 6 percent in 2030 (NPC, 2011). Empirical literature as in, for example, the findings by Kerr *el al.* (2014) suggests that a generic approach to supporting MSMEs may not be an effective use of resources because MSMEs as a sector may not be a net job creator. There is therefore a need to identify and understand the profile of firms that are net job creators.

1.4 OBJECTIVE OF THE THESIS

Since 1994, South African government policy has emphasised the importance of MSMEs as a means of fostering social cohesion. It has done so by promoting enterprises owned by ethnic groups previously disadvantaged by apartheid. Government policy also underscores the role of MSMEs in creating jobs and contributing to economic growth. Empirical evidence globally suggests that access to finance is the most serious obstacle to the growth of MSMEs. Studies on MSMEs in South Africa also point to the same conclusion, albeit with limited assessment of the effects of access to finance and other obstacles on enterprise performance. There is thus a gap in the literature on the impact of obstacles on enterprise performance and on which obstacles impede growth the most.

There is a growing body of empirical evidence, particularly in developed economies, showing that a small proportion of enterprises account for most new jobs in an economy (Nightingale and Coad, 2013; Henrekson and Johansson, 2010). The subject of high-growth firms is underexplored in South Africa and in developing countries as a whole. The evidence that a small proportion of firms accounts for most net new jobs suggests that it may be beneficial to understand the profile of such firms as they could expedite job creation, thus improving living standards, productivity and social cohesion.

The thesis therefore seeks to:

i. determine the key impediments to the growth of MSMEs in South Africa,
ii. determine the characteristics of financially constrained MSMEs in South Africa,

iii. determine the characteristics of enterprises that generate jobs more than the generality of firms in South Africa, and
iv. based on the findings, propose targeted interventions in the MSME sector that could improve the socioeconomic circumstances of many South Africans through access to formal employment.

1.5 CONTRIBUTION OF THE THESIS

Inasmuch as cross-country studies are useful in showing a global view of MSMEs, they are less so in informing national policies. National studies that attempt to bridge this gap are constrained by unrepresentative samples which make their contribution to policy limited. In this regard, this thesis provides an important contribution to the empirical literature in South Africa by using a survey designed to be representative of the diversity of MSMEs.

MSME studies in South Africa describe obstacles faced by business owners and the extent to which business owners rate the severity of the obstacles on enterprise operations. The thesis contributes to this literature by linking such ratings of the severity of obstacles to actual performance of the firm and is thus able to determine the most critical obstacles. Furthermore, the effects of obstacles on enterprises are not determined only on firms grouped by size (i.e. micro, small, medium or large) but the obstacles' effects on interacted firm characteristics, such as level of education of the business owner and sector of the firm, are also determined. The effects of the interaction terms provide a more vivid depiction of what interventions must seek to address and the enterprises that must be targeted for improved impact.

There is limited discussion on high-growth firms in developing countries with emphasis being on the MSME sector as a whole (Goedhuys and Sleuwaegen, 2010; Bradford, 2007). The thesis builds on the limited research on high-growth firms to encourage discussion of this important subset of the MSME sector that could facilitate more effective use of intervention resources than when support is generic. Although the use of WBES limits the thesis to variables in the database, the detailed analysis on South Africa is useful in encouraging debates on firms accounting for most of the net new jobs.

1.6 OVERVIEW OF THE THESIS

Chapter 2 discusses the MSME sector in South Africa by reviewing small enterprise development policy. Three empirical chapters follow. Chapter 3 investigates the main barriers to the growth of MSMEs and estimates the effects of such barriers on growth. Growth is proxied by the number of jobs created. The relative importance of barriers is determined so as to inform policy on the sequence or order in which interventions can be implemented.

Chapter 4 studies the finance constraint. The analysis tracks the importance of the problem between 2003 and 2010 and assesses its impact on growth. The chapter also determines the profile of firms encountering problems in accessing finance. The focus on access to finance is motivated by the extensive empirical evidence showing access to finance as the main constraint to growth, especially in developing countries. The chapter informs policy on the type of firms interventions should target.

While Chapters 3 and 4 examine obstacles to growth, Chapter 5 seeks to explain why some firms perform better than the generality of other firms. The chapter investigates whether such high-growth firms have distinct characteristics. The analysis of high-growth firms is important in that it informs policy on what interventions should nurture if more jobs are to be created at a faster rate. The final chapter, Chapter 6, summarises the research and concludes with some policy and research recommendations.

CHAPTER 2: SMALL ENTERPRISE DEVELOPMENT POLICY IN SOUTH AFRICA

2.1 INTRODUCTION

This chapter describes the socioeconomic environment motivating the emphasis of government policies on micro, small and medium enterprises (MSMEs) in South Africa. The chapter also gives an overview of the MSME sector by reviewing the small enterprise development policy and institutions through which the policy is implemented. The final section of the chapter describes the WBES data used in the empirical analyses of the next three chapters and presents some descriptive statistics.

2.2 THE SOCIOECONOMIC ENVIRONMENT MOTIVATING MSME PROMOTION

The main criticism of cross-country studies as raised in the preceding chapter is that peculiarities of a country are smoothed-off, resulting in policy recommendations that may not suit a country of interest. Table 2.1 presents some socioeconomic statistics of the BRICS countries (Brazil, Russia, India, China and South Africa) as well as Nigeria and Ghana to demonstrate the peculiarity of South Africa among its peer states. The middle-income status of the selected countries and their shared development strategy, particularly among the BRICS (as illustrated by the launch of the jointly owned New Development Bank in 2014), makes this selection of peer states reasonable. The column headed ‘Middle Income’ in Table 2.1 indicates the composite statistics for all middle-income countries globally.

For South Africa, the unemployment rate was 22.3 percent while the average for all middle-income countries was 5.5 percent. The youth unemployment rate in South Africa was close to three times that of middle-income countries and the highest in the countries shown in Table 2.1. The proportion of working-age population with jobs at 41.8 percent compared unfavourably to the middle-income countries’ average of 60 percent and it is the worst for all the countries in the table. Poverty headcount was the highest in the middle-income economies; also, the Gini index for South Africa, which is an estimate of income inequality, was the highest in the world. The unemployment rate of the tertiary-educated is low in South Africa such that the less educated and the youth are more likely to be unemployed.

Table 2.1: Socioeconomic indicators of South Africa and selected countries (2007)

Indicator Name	Middle Income	Brazil	Russia	India	China	South Africa	Nigeria	Ghana
GDP per person employed (constant 1990 PPP $)	10 424	12 877	17 978	7 170	9 975	13 197	5 354	3 877
Employment to population ratio, 15+, total (%)	60.26	63.90	59.20	56.30	69.40	41.80	51.00	66.10
Ratio of female to male labour force participation rate (%)	64.55	71.92	81.57	40.58	82.95	74.96	76.32	94.20
Unemployment with secondary education (% of total unemployment)	..	35.70	54.20	..	..	56.30	..	..
Unemployment with tertiary education (% of total unemployment)	..	4.10	32.10	..	..	4.50	..	..
Unemployment, total (% of total labour force)	5.51	8.10	6.00	3.90	3.80	22.30	7.60	3.60
Unemployment, youth total (% of total labour force ages 15-24)	12.70	16.70	14.40	9.20	8.00	46.60	13.80	6.40
Gini index	..	54.69	40.11	33.9	58.88	63.14	48.83	42.06
Poverty headcount ratio at $2 a day (PPP) (% of population)	41.17	11.32	0.08	..	29.79	31.33	..	..
Self-employed, female (% of females employed)	..	26.30	6.70			18.90		
Self-employed, male (% of males employed)	..	34.00	8.00			16.20		
Self-employed, total (% of total employed)	..	30.80	7.30			17.40		
Cost of starting a business (% of income *per capita*)		4.6	1.3	47.3	2.0	0.3	58.3	15.7
Number of procedures to start a business		13	7	12	13	5	8	8

Sources: World Development Indicators; World Bank poverty and inequality database; Doing business for SMEs database

The socioeconomic statistics in Table 2.1 are conducive of high-levels of small business start-ups. Besides the high unemployment rates which would typically generate a large number of necessity-driven firms, the cost and number of procedures to starting a business in South Africa are quite

favourable to start-ups as shown by the last two rows of Table 2.1. However, the GEM data summarised in Figure 2.1 reveals that South Africans score poorly on two key indicators of entrepreneurship: the perception of entrepreneurial opportunities, and the intention to exploit such opportunities as entrepreneurs.

Two reasons are plausible for why South Africa scores poorly on entrepreneurship indicators. The first is the social welfare grants programme, which Marais (2011: 238) suggests had 14 million beneficiaries in 2013, which is approximately a quarter of the total population. A study by Bhorat, Tseng and Stanwix (2014) using the national household Income and Expenditure Surveys and the Consumer Price Index found that although aggregate poverty levels declined in the period 1995 to 2005, levels of inequality increased. Bhorat *et al.* (2014) attributed the fall in aggregate poverty to social grants that arguably minimised the momentum to necessity-driven entrepreneurship despite the consistently high levels of unemployment as shown in Figure 2.2. The second reason is the legacy of apartheid.

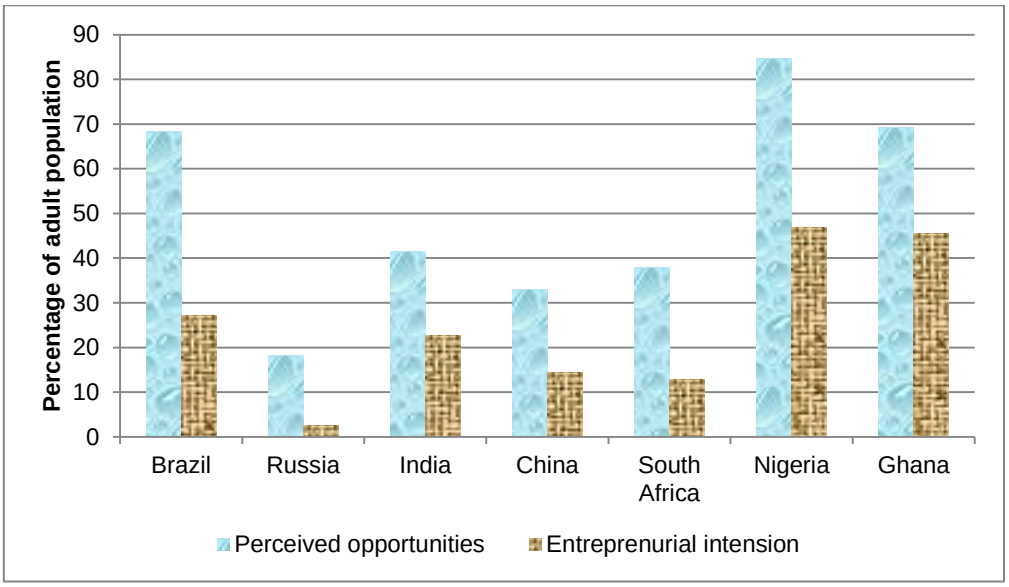

Figure 2.1: Indicator of entrepreneurship: South Africa and selected countries

Source: Global Entrepreneurship Monitor (2011)

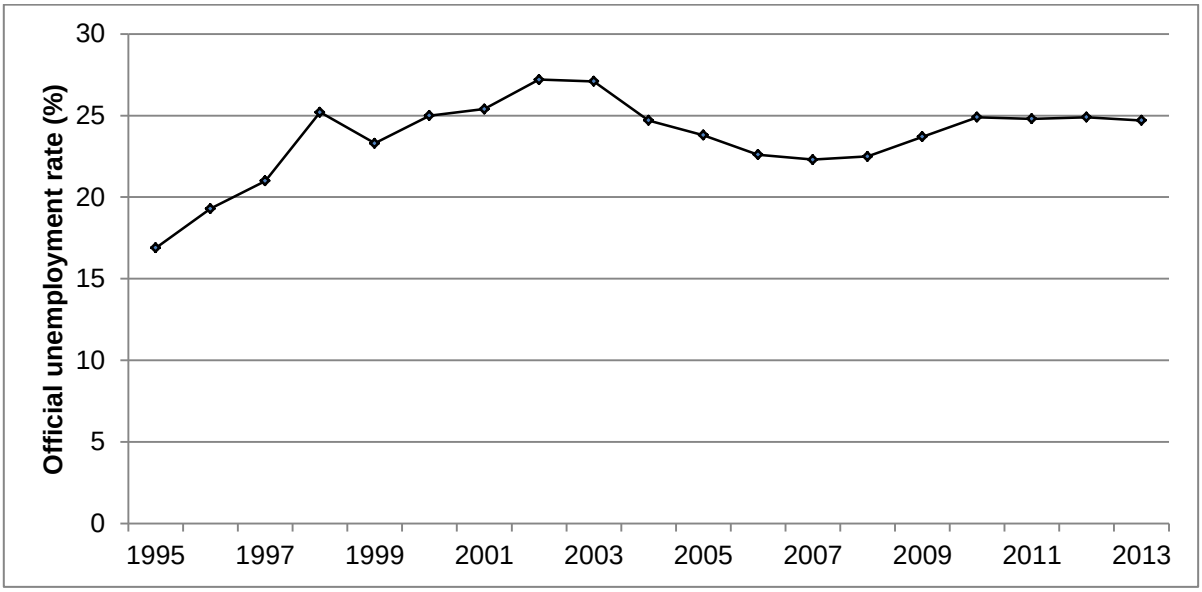

Figure 2.2: Unemployment in South Africa

Source: South African Reserve Bank (2014)

Laws such as the Group Areas Act from 1950 restricted the extent to which most South Africans could venture into business. Black entrepreneurs often incurred losses because of intermittent raids by authorities (Simon and Birch, 1992; Beavon and Rogerson, 1986). Rogerson (2004) shows in a review of small enterprise development policy, support programmes and empirical literature from 1994 to 2003 that white-owned firms accounted for a higher proportion of beneficiaries from intervention such as the Small and Medium Enterprise Development Programme (SMEDP) than black entrepreneurs in the first decade of a democratic South Africa. Rogerson (2004) argued that the low level of uptake by black entrepreneurs of such interventions was because black-owned firms were predominantly informal and thus less able to access supports targeting formal SMEs, an argument that perhaps demonstrates the lingering effects of the apartheid era.

2.3 MSME DEVELOPMENT POLICY IN SOUTH AFRICA

On the back of high unemployment and inequality, the small enterprise development policy seeks to promote enterprise competitiveness in the global market, citizens' welfare by reducing poverty, and social equity by supporting the previously disadvantaged South African (Rogerson, 2004). The White Paper on the National Strategy for the Development and Promotion of Small Business in South Africa of 1995 (henceforth White Paper, 1995) set the policy framework for promoting small businesses. The White Paper (1995) was informed by international evidence on the obstacles that must be addressed by policy for small businesses to grow. For instance, it observes that "in surveys among small enterprises all over the world, access to finance comes out as one of the

most urgently felt needs". Management and skills training are mentioned as add-ons to the finance interventions.

But the implementation of the White Paper (1995) encountered challenges especially because the country at that point lacked institutionalised support structures and a regulatory environment for emerging firms. Some of the support institutions had to be set up before the necessary regulatory systems were in place. For example, Khula Finance Limited, the financing agency set up in 1996 to address issues in access to finance, had large write-offs and low take-up of its credit guarantee products in the period 1997 to 2002 (Makina and Malobola, 2004; Rogerson, 2004; Nigrini and Schoombee, 2002). A key reason for the write-offs was that the microfinance industry to which Khula Finance Limited extended wholesale finance was largely unregulated, leading to most microfinance institutions folding (Bauman, 2004; Christen and Pearce, 2004). A case study of four microfinance institutions by Bauman (2004) found that microfinance institutions had high staff costs and that employees lacked appropriate skills for their responsibilities. On non-financial support, the advisory agency Ntsika Enterprise Promotion Agency, set up by the government in 1996, was undercapitalised such that its national outreach programme, particularly the Local Business Service Centres initiative, was not as effective as was envisioned by the White Paper of 1995 (Rogerson, 2004).

Thus, in its first decade in office, the African National Congress government put in place an institutional system to support MSMEs. However, studies that have sought to evaluate the impact of the interventions of that period (for example the credit guarantee scheme by Khula Finance Limited) show that there was minor positive impact on MSMEs. The studies have attributed this to limited nationwide presence of the institutions that were set up to support MSMEs and that there was limited awareness by MSME owners of the intervention programmes such institutions were providing (Rogerson, 2004; Ladzani and Netswera, 2009; Netswera, 2001). A survey of 534 MSMEs in Limpopo province by Ladzani and Netswera (2009) for instance, showed that potential beneficiaries were not aware of support programmes available. An earlier study by Netswera (2001) on 60 MSMEs who were members of Johannesburg Chamber of Commerce also found limited awareness of public support initiatives among small business owners.

The Integrated Strategy on the Promotion of Entrepreneurship and Small Enterprises of 2005 sought to address the poor performance of the first decade in enterprise promotion (DTI, 2005). The strategy had three action plans: to promote enterprise development, to increase the supply of financial and non-financial support, and to create demand for output from smaller enterprises (DTI, 2005: 4). The integrated strategy of 2005 restructured the institutions set up to support MSMEs. The Small Enterprise Development Agency (SEDA) succeeded the Ntsika Enterprise Promotion Agency, while the South African Microfinance Apex Fund (SAMAF) was formed to regulate the microfinance industry and provide wholesale finance along with Khula Finance Limited to

microfinance institutions and Savings and Credit Cooperatives (SACCOs). The Broad-Based Black Economic Empowerment (BBBEE) legislation of 2004 sought to create demand for the output of MSMEs and to ensure that enterprise support and development would thereafter be a joint initiative of large businesses and government.

The BBBEE legislation since 2004 has been an important strategy to implement MSME development policy. The BBBEE legislation has a scorecard system with a total of 105 points. Established organisations earn the points by spending at least three percent of their annual net profit after tax on the five elements in the BBBEE scorecard. Of the five, two are closely associated with MSMEs: enterprise and supplier development with 40 points and socioeconomic development with 5 points. In essence, the BBBEE legislation compels all established entities to facilitate growth of MSMEs. In most economies, such expenditures would be voluntary corporate social investment. Under the BBBEE legislation, the procurement procedures also require that public departments and other established organisations procure some of their inputs from MSMEs.

There is limited research on approximate resources and impact on enterprise development of support attributable to BBBEE requirements, with existing studies focusing on transactions involving changes of shareholdings in big companies (Patel and Graham, 2012; Jackson, Alessandria and Black, 2005). Inasmuch as the Impact Amplifier (2013) report finds limited contribution of BBBEE to socioeconomic development, the hypothetical volume of resources available from large firms in South Africa suggests that support attributable to BBBEE requirements is larger. It perhaps has potential for a wider reach and impact on enterprise development than the dedicated public agencies that have limited budgets and branch network. Furthermore, the public-private partnership implicit in the BBBEE framework makes imminent the emergence of hybrid organisations such as social businesses envisaged by Yunus (2007) that raise and manage resources from multiple stakeholders to deliver financial returns and social good.

Since the Integrated Strategy on the Promotion of Entrepreneurship and Small Enterprises of 2005, the country development policies, especially the New Growth Path of 2010 (NPC, 2010) and National Development Plan of 2011 (NPC, 2011), continue to emphasise the role of the small business sector in creating jobs and diversifying the industrial sector. In 2014, a dedicated Ministry of Small Business Development was created, signalling the increasing importance of the sector. The new Ministry has a mandate to improve the performance of the MSME sector and ensure that an enabling business environment is in place so that the much-needed jobs are created. Previously, enterprise development policy had been under the Department of Trade and Industry with SEDA as the principal agency to implement and coordinate the policy while offering non-financial support to MSMEs. At the end of 2013, SEDA had 9 provincial offices and 43 branches nationally (SEDA, 2013: 8). The other key public institution is SEFA (Small Enterprise Finance

Agency) which was set up in 2012. SEFA, which incorporates the former Khula Finance Limited and SAMAF, finances MSMEs directly and wholesale through financial services providers such as microfinance institutions and SACCOs. SEFA has 9 offices nationally (SEFA, 2013).

In summary, government has since 1994 created dedicated institutions to implement the small enterprise development policy. Through the BBBEE requirements, policy has extended the challenge of promoting MSMEs to well-established organisations in the private sector.

2.4 MSMES IN SOUTH AFRICA

The National Small Business Amendment Act of 2003 lists four categories of MSMEs: a microenterprise has less than 5 employees, a very small firm has 5 to 20, a small firm 21 to 49, and a medium firm between 50 and 200. MSMEs are estimated to account for up to 57 percent of employment (SEDA, 2012). A survey by Finscope (2010) which defined a small business as employing up to 200 workers estimated that there were about 6 million small businesses in South Africa, and found that 84 percent of small business owners were black. The finding of the survey that 67 percent of the owners were solely dependent on income from the business shows the importance of small businesses to people's livelihood and the economy. Furthermore, a third of small business owners started their business because they could not find jobs or had been retrenched, which suggests that their enterprises would be significantly undercapitalised to exploit identified opportunities. Without support, it is difficult to envisage such MSMEs contributing significantly to job creation and playing an important role in reducing social and economic inequalities.

With regard to social and economic inequalities, Figure 2.3 shows that income inequality has persisted since 1995 with the share of income increasing for the highest 20 percent but declining in all the lower categories such that income held by the lowest ten percent is one percent. The scenario depicted in Figure 2.3 is of possible social tensions that "have the potential to undermine the post-apartheid transition, threatening the nation's economic, political and social stability" (Struwig *et al.*, 2013: 399). In a country with a population of about 52 million, the 6 million MSMEs may indeed be indispensable to policies that seek to achieve inclusive growth. It is therefore imperative that the entrepreneurial efforts of citizens to improve their socioeconomic circumstances are carefully studied so that policymakers can design and implement appropriate support interventions.

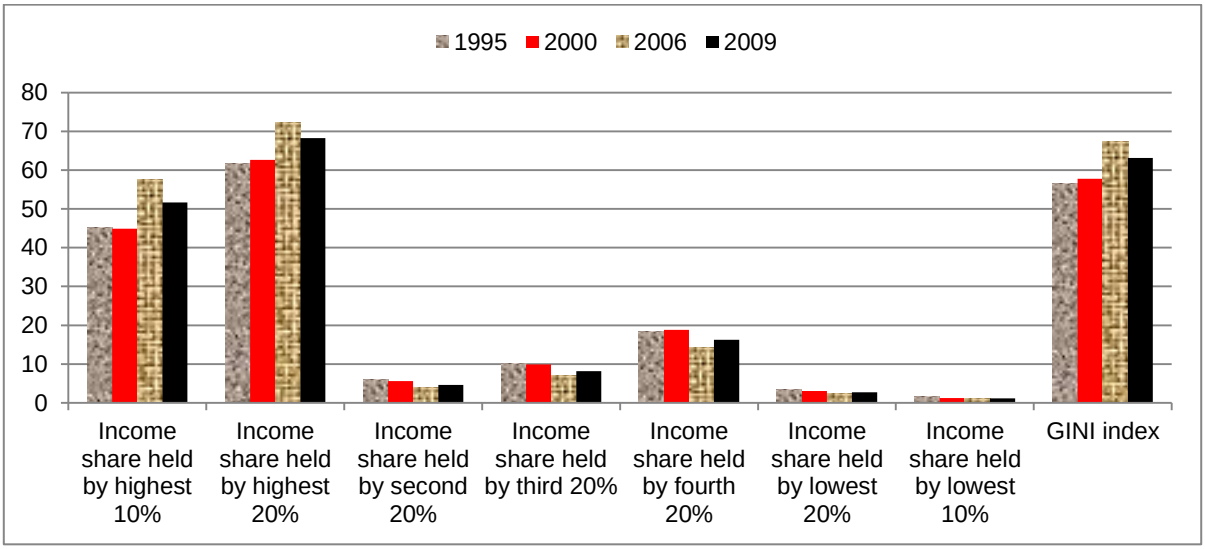

Figure 2.3: Inequality in South Africa 1995 to 2009

Note: The percentage of income held in 1995 and in 2009 is above the respective bars. The Gini index for 1995 and for 2009 is also above the respective bars.

Source: World Development Indicators

This chapter next describes the WBES data used in the next three chapters to study MSMEs in South Africa. The section discusses the sampling approach used by the WBES and presents some descriptive statistics on the types of firms making up the data.

2.5 DESCRIPTION OF WORLD BANK ENTERPRISE SURVEY DATA

The WBES started in 2002 to gather firm-level data from representative samples using a uniform data collection instrument in member countries of the World Bank. By 2014, the WBES had data on 130 000 firms in 135 countries. The survey instrument is comprehensive and discussed in detail by Kuntchev, Ramalho, Rodríguez-Meza and Yang (2013). The instrument includes personal characteristics of owners such as gender, ethnic origin, education and work experience. It includes firm characteristics such as number of employees, sector, target market (local or export), turnover, profitability, and composition of balance sheet. It provides insight into the plans of the firm by, for example, asking managers if their firms have or intend to undertake capital expenditure or expansion projects. Firms report on whether they applied for external finance and the outcome of the applications including reasons for rejection.

Firms also provide feedback on how they rate the business environment obstacles such as access to finance, crime and disorder, macroeconomic and political stability and access to infrastructure, for example electricity and transport. Firms report on the challenges they encounter in trying to access finance, electricity, input materials and customers and how they addressed some of the challenges, for example by procuring a generator in the case of erratic supply of electricity or

spending on security service providers to limit the effects of theft. The instrument also collects labour relations information such as workers' level of education.

Two WBES have been conducted in South Africa: the first in 2003 and the second in 2007. There was a survey in 2010 by the World Bank to assess the impact of the global financial crisis on firms. The 2010 survey covered a small sample of 234 firms. Unlike WBES, which gather data on a broader range of a firm's business environment and operations, the 2010 survey focused on assessing the effects of the global financial crisis on firms' access to finance. The 2010 survey is therefore useful in studying the finance constraint. All three surveys covered four locations: Cape Town, Durban, Johannesburg and Port Elizabeth. The 2007 survey targeted establishments employing five or more full-time and paid permanent employees, but 120 microenterprises in Johannesburg with less than five employees were also covered by random sampling. WBES defines firms with between 5 and 20 employees as small, firms with 21 to 99 as medium-sized and firms with over 100 employees as large.

In 2007, 1 057 establishments were surveyed. Of these, 706 were randomly sampled within a stratified list of 9 550 firms from the Department of Trade and Industry and the Intellectual Property Registration Office, while 231 firms were randomly drawn from the 2003 survey of 803 establishments. Of the 231, only 191 could be matched in the 2007 survey data. There is thus a panel set of 191 firms between 2003 and 2007 which is utilised to overcome omitted variables problem in some of the analysis in the thesis, particularly on investigating the effects of the finance constraint over time. The balance of 120 firms to make up 1 057 firms in 2007 relates to microenterprises which were randomly sampled in Johannesburg. Table 2.2 summarises the data used by firm size.

Table 2.2: Number of enterprises surveyed by size and year

	2003	2007 only	2003 and 2007 (panel)	2010
Micro enterprises	40	120	-	-
Small enterprises	217	375	12	122
Medium enterprises	185	366	67	72
Large enterprises	361	196	112	40
Total	803	1057	191	234

Source: World Bank Enterprise Surveys in South Africa

The 2007 survey is the main data used in the analyses of Chapters 3, 4 and 5. The 2007 survey covered 113 small and medium firms in Cape Town, 105 in Durban, 49 in Port Elizabeth and 474 in Johannesburg. In the three empirical chapters that follow, firms in Durban and Port Elizabeth are combined in a group called 'Durban and Port Elizabeth' because of the smaller sample sizes. Table 2.3 reports some descriptive statistics relating to age of the firms, years' experience of

managers, annual turnover and level of exports in turnover for the 1 057 firms surveyed in the four locations, grouping them by size.

Table 2.3: Descriptive statistics of firms by size

Variable		Number of firms	Mean	Standard deviation	Minimum observed	Maximum observed
ALL	Age of firm (years)	1 056	15.94	17.77	1.00	141
	Percentage help by largest owner	1 057	77.15	25.61	5.00	100
	Experience of top manager (years)	1 055	13.75	10.69	1.00	61
	Annual turnover (ZAR)	1 057	70 100 000	402 000 000	7 200	7 200 000 000
	Percentage of exports in turnover	1 056	16	37	0.00	1
Micro	Age of firm (years)	119	5.20	5.87	1.00	39
	Percentage help by largest owner	120	89.76	19.16	25.00	100
	Experience of top manager (years)	120	6.89	6.18	1.00	34
	Annual turnover (ZAR)	120	475 994	968 075	7 200	8 000 000
	Percentage of exports in turnover	120	3	18	0.00	1
Small	Age of firm (years)	375	9.19	9.54	1.00	86
	Percentage help by largest owner	375	83.99	22.91	10.00	100
	Experience of top manager (years)	373	11.01	9.50	1.00	45
	Annual turnover (ZAR)	375	3 155 483	4 150 913	100 000	30 000 000
	Percentage of exports in turnover	375	7	25	0.00	1
Medium	Age of firm (years)	366	18.18	17.04	1.00	141
	Percentage help by largest owner	366	73.76	25.11	5.00	100
	Experience of top manager (years)	366	16.14	11.16	1.00	60
	Annual turnover (ZAR)	366	20 900 000	36 600 000	90 000	328 000 000
	Percentage of exports in turnover	365	18	38	0.00	1
Large	Age of firm (years)	196	31.18	23.84	1.00	116
	Percentage help by largest owner	196	62.68	26.84	5.00	100
	Experience of top manager (years)	196	18.70	10.50	1.00	61
	Annual turnover (ZAR)	196	333 000 000	886 000 000	1 732 000	7 200 000 000
	Percentage of exports in turnover	196	38	49	0.00	1

Source: World Bank Enterprise Surveys (2007)

The level of education of business owners or managers is of particular interest to enterprise development policy makers and practitioners and is a key variable explored by empirical analyses (Gelb, Ramachandran, Shah and Turner, 2007; McGrath 2005). Figure 2.4 shows a positive association of higher levels of education with size of firms such that smaller firms have managers with low levels of education. The relationship between firm size and vocationally trained managers is mixed.

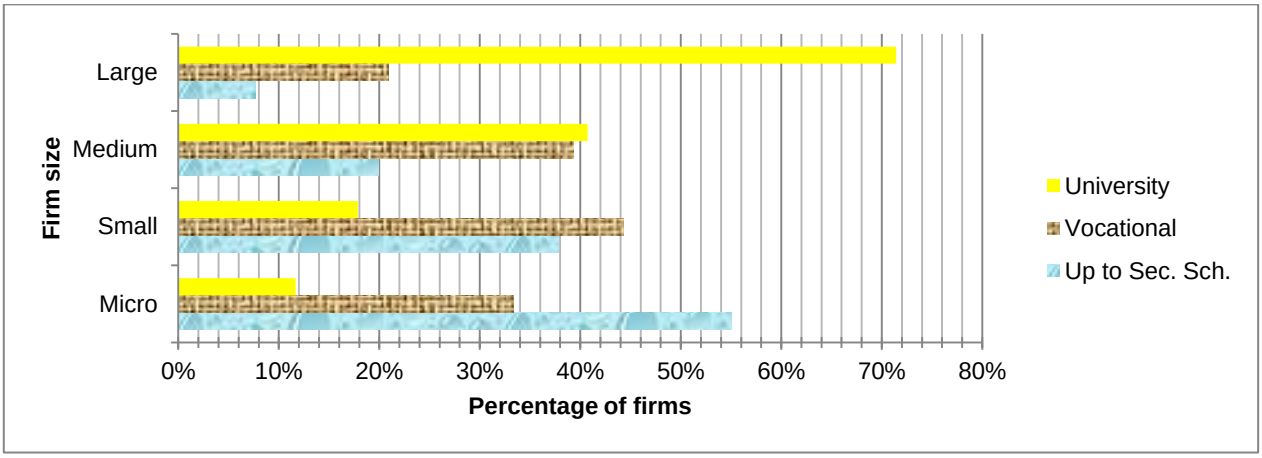

Figure 2.4: Firm size and education level of top manager

Source: World Bank Enterprise Surveys (2007)

Grouping the firms by age in Figure 2.5 shows that 69 percent of microenterprises in the sample are less than 5 years old and 7 percent are more than 15 years old. Among small firms, there are more young firms than old ones but the distribution pattern changes for medium firms, where 44 percent of the firms in the sample are old and 17 percent are less than 6 years old.

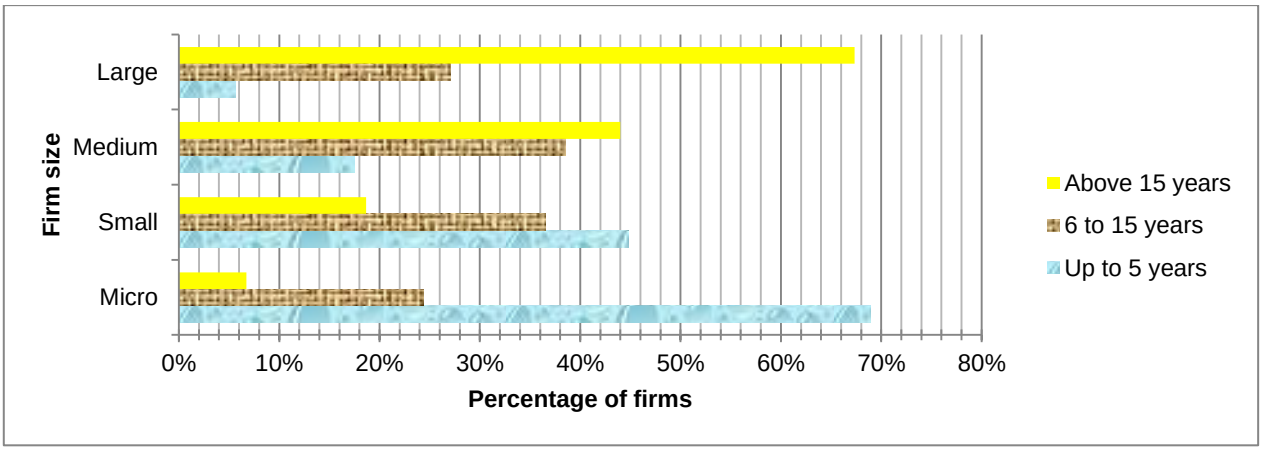

Figure 2.5: Firm size and age group

Source: World Bank Enterprise Surveys (2007)

WBES in South Africa list six ethnic groups for business owners: African, European, Indian, Lebanese or Middle Eastern, Other Asian and Other. In the three empirical chapters that follow, Indian, Lebanese or Middle Eastern, Other Asian and Other are aggregated in a group called 'Asian'. Figure 2.6 shows the proportion of firms by size in the sample where the main ownership is African (or black), Asian, and European (or white).

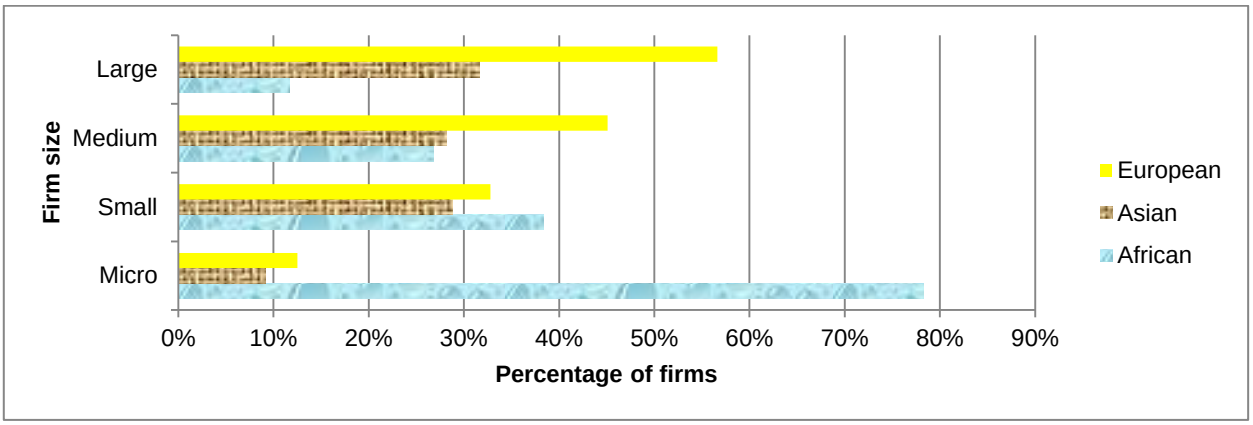

Figure 2.6: Firm size and ethnic origin of owner

Source: World Bank Enterprise Surveys (2007)

Figure 2.6 shows that blacks own 78 percent of microenterprises and also that as firm size increases, the proportion of black-owned firms declines and Asian and white ownership increases.

2.6 SUMMARY

As a prelude to Chapters 3, 4, and 5, this chapter reviewed the enterprise development policy in South Africa and the socioeconomic environment underpinning the policy. The chapter also gave an overview of the public institutions set up to implement the policy and discussed the requirements of the BBBEE legislation. Finally, the WBES data on South Africa that will be used in the next chapters was presented. The use of the WBES, which gathers firm-level data using the same survey instrument globally, ensures that the analyses in the thesis can be replicated in other economies.

CHAPTER 3: WHAT IMPEDES THE GROWTH OF MICRO, SMALL AND MEDIUM ENTERPRISES IN SOUTH AFRICA?

3.1 INTRODUCTION

The aim of this chapter is to identify, rank and determine the most binding obstacles to the growth of micro, small and medium enterprises in South Africa. As recognised by Ayyagari *et al*. (2008), the enterprise development literature has shown that many obstacles (e.g. access to finance, labour regulations, tax rates, access to land etc.) affect the growth of MSMEs but there is limited discussion on how the obstacles are to be prioritised so that policymakers can address them. An investigation that seeks to rank the obstacles based on their effects on growth is therefore important because it would inform policy about the types of interventions necessary to address the key obstacles and improve the growth of MSMEs.

This chapter defines growth as the inter-period change in jobs created by a firm. The chapter builds on the Growth Diagnostics framework of Hausmann, Rodrik and Velasco (2005). Growth Diagnostics is based on the premise that not all obstacles to growth are equally binding and that by determining and eliminating the most binding obstacles, optimal growth is realised even though other obstacles are still in place. The WBES data have been used by Ayyagari *et al*. (2008) and Dihn *et al*. (2010) to identify top and binding constraints. WBES are suitable for such investigations because the Surveys have summarised the extensive list of obstacles to 15, thus making the data an important reference for investigating the top and binding constraints.

In the WBES, firms report on whether each of the 15 obstacles is ‘not an obstacle’, a ‘minor’, ‘moderate’, ‘major’ or a ‘very severe’ obstacle to their operations. Obstacles include employees’ skills adequacy, access to finance, electricity, crime, and efficacy of the legal system or courts among others. From the list, a pertinent question is which obstacles or, better still, which obstacle, must be prioritised given limited resources and the impracticality of tackling all obstacles at once.

3.2 LITERATURE REVIEW ON KEY OBSTACLES TO MSME DEVELOPMENT

The question of the prioritisation of business environment obstacles to growth has been addressed by relatively few studies (e.g. Ayyagari *et al.,* 2008; Dihn *et al.,* 2010; Beck, Demirgüç-Kunt and Maksimovic, 2005) and the studies based their investigations on the Growth Diagnostic framework. Beck *et al.* (2005) used World Business Environment Surveys of 1999 to 2000 to investigate if the effects of access to finance, legal obstacles and corruption on growth are determined by firm size, and found that these three constraints significantly affected firms employing 5 to 50 workers.

Ayyagari *et al.* (2008) also used WBES. Unlike Beck *et al.* (2005), who began their analysis with an *a priori* list of three obstacles, Ayyagari *et al.* (2008) used an artificial intelligence-based Directed

Acyclic Graph methodology to determine three obstacles affecting growth the most. They found access to finance, crime and political instability to be the top obstacles. The authors then determined the most binding by multivariate regression analysis. The top three obstacles enter the regression all at once, along with firm and country-specific characteristics as control variables. Finance was found to have the largest effect on growth and was thus deemed binding.

Dihn *et al.* (2010) used the WBES of 2007 to 2010, and they identified the top constraints by a count of responses of firms' ratings of obstacles and found electricity, finance and tax rates as top obstacles. They determined the binding constraint through three sets of sequential multivariate regressions. The first set examined the independent effect of an obstacle on growth. In the second, all obstacles entered the regression at once for the effect of each obstacle in the presence of other obstacles to be determined. In the final set, only obstacles significant in the second set entered the regression. All regressions have intercept term, firm and country characteristics as control variables. Finance emerged as binding.

The foregoing three studies are cross-country. Beck *et al.* (2005) used 54 countries from the developed and developing world, Ayyagari *et al*. (2008) used 80 from the same while Dihn *et al*. (2010) used 96 developing countries. Although all found finance binding, the top constraints varied. Two datasets from different periods made up of different countries can indeed be reasonably expected to yield different top constraints. But importantly, the difference suggests the distinctiveness of countries. Gelb *et al*. (2007) used WBES to explore how obstacles vary in 27 African countries (including South Africa). They determined the top obstacles for each country in two ways: firstly by a count of firms' own subjective ratings of the obstacles, which the authors found considerably different from country to country. Secondly, they estimated the effects of the obstacles using more objective indicators on growth, for example in the case of electricity, by substituting the rating of electricity with the actual number of power supply interruptions. They found that the effects of the objective measures of obstacles on growth varied with countries' levels of *per capita* income. Specifically, low income countries were most affected by infrastructure-related obstacles such as electricity, while countries with higher levels of income were most affected by the regulatory environment such as labour regulations.

It may seem trivial to emphasise that obstacles differ by country. Yet, in the context of the cross-country enterprise development literature, the emphasis is necessary because the peculiarities of countries are smoothed-off in cross-country studies such that resultant policy diagnoses are generic, best suiting the average country. Country-specific studies become necessary to identify specific issues that can credibly inform policy. This chapter demonstrates that policy recommendations drawn from a country-specific study can vary considerably from cross-country recommendations. For instance, whereas studies of MSMEs in developing countries find access to finance as the top and binding constraint, this chapter shows that the top constraint for all firms in

South Africa is crime, and the most binding for MSMEs is the efficacy of the legal system i.e. courts. After grouping firms by size, age, sector, location and owner's gender and ethnic origin, the effects of the obstacles are found to vary across the groups. Medium-sized enterprises are mildly affected by all obstacles reviewed, while small firms are collectively constrained by 'courts' and electricity. There are limited effects of obstacles on firms in Durban and Port Elizabeth. Access to finance is only a significant constraint for small white-owned firms and small firms in Cape Town. The results suggest that a study of local circumstances may identify key obstacles with greater precision and perhaps engender more suitable policy recommendations.

3.3 DETERMINING THE TOP CONSTRAINTS TO MSME DEVELOPMENT

In investigating the key obstacles, researchers often present a list of possible obstacles for business owners to rate on a Likert scale. A simple count of responses determines the top constraints. Dihn *et al.* (2010), Gelb *et al.* (2007) and Ayyagari *et al.* (2007) adopted this approach on WBES data. The problem with this approach is that the firms will only be responding to a specific obstacle and rating only that obstacle but not ranking the obstacle against 14 others. To address this weakness, this chapter suggests using responses to the following question in the survey instrument: "among the issues numbered 1 to 15, please indicate which one constitutes: the most serious obstacle; the second most serious obstacle; the third most serious obstacle". A weight score of 3 is assigned to the first most serious constraint, 2 to the second and 1 to the third most serious. Multiplying the score by the respectively observed frequencies and respectively summing the product of the first, second and third most serious obstacle for each firm, the relative importance of each of the 15 obstacles is determined by ranking based on the final weighted scores. This approach will be referred to as the weighted count approach throughout this chapter.

The results for all firms are graphed in Figure 3.1 against results from a simple count of ratings above a 'moderate'[3] rating. Beck, Demirgüç-Kunt, and Levine (2006) and Coluzzi, Ferrando and Martinez-Carrascal (2012) also consider ratings above the moderate rating as a benchmark for an obstacle to be considered serious. In both the simple count of ratings and the ranking by the weighted count approach, crime is the top obstacle, followed by electricity. Access to finance is the fourth on the simple count method but fifth in the weighted count approach, while workers' education becomes the fourth most important in the weighted count approach from being seventh in the simple count approach.

[3] A 'moderate' rating of an obstacle is the mid-point in a 5 point Likert scale which, in increasing order of severity are: no obstacle, minor, moderate, major, very severe. Ratings above moderate therefore refer to 'major' and 'very severe'.

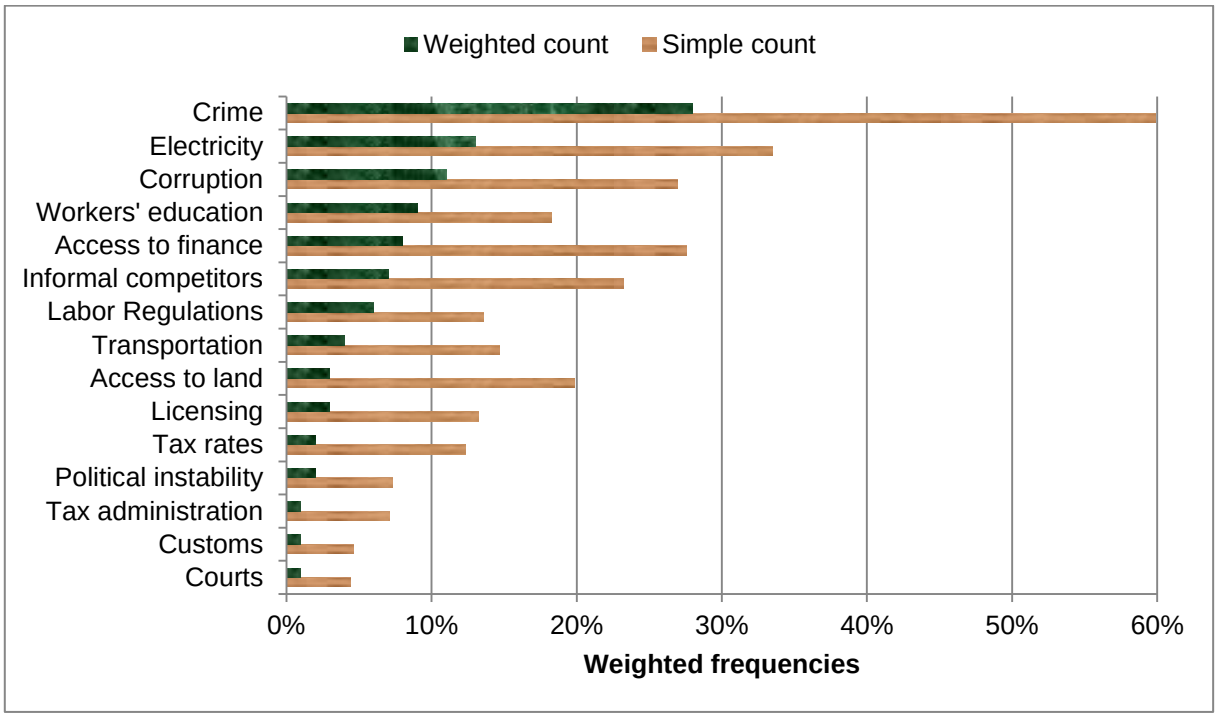

Figure 3.1: Rating of constraints by firms in South Africa

Source: Author's estimations based on World Bank Enterprise Surveys of South Africa (2007)

Table 3.1 reports the top five obstacles by firm size. Crime comes out as the top obstacle across all firm sizes. Access to finance only appears as a second top obstacle for micro enterprises.

Table 3.1: Relative weights (%) of top 5 obstacles for MSMEs in South Africa

Constraint		**Size of enterprise**			
Rank	Name of constraint	Micro	Small	Medium	MSMEs
1	Crime, theft and disorder	17.61	29.90	30.91	28.49
2	Electricity	9.58	13.75	11.69	12.25
3	Corruption		10.36	11.74	10.45
4	Access to finance	14.93	10.11		9.44
5	Practices of competitors in the informal sector	10.70	9.57		7.81
-	Inadequate education			11.05	
-	Labour regulations			7.38	
-	Transportation	10.00			
	Total weight of the 5 key constraints	62.82	73.69	72.76	68.44

Source: Author's estimations based on World Bank Enterprise Surveys of South Africa (2007)

Figure 3.2 compares some of the top obstacles in South Africa reported in Figure 3.1 to the top obstacles of the 96 developing economies reported in Dihn *et al.* (2010).

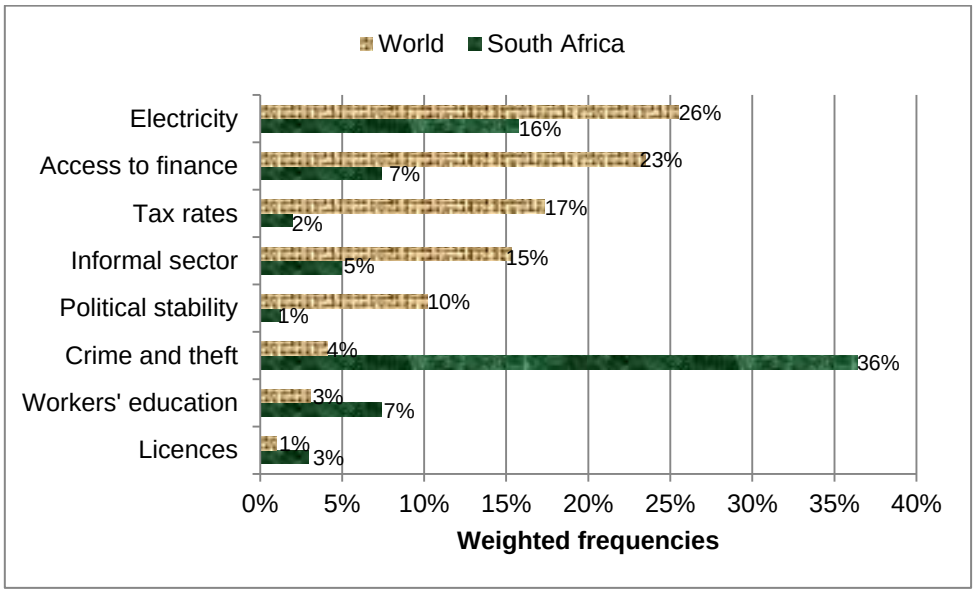

Figure 3.2: Top constraints by enterprises – South Africa vs. the World

Source: Dihn *et al*. (2010: 10); Author's estimations based on World Bank Enterprise Surveys of South Africa (2007)

The differences captured by Figure 3.2 suggest that the policy recommendations from cross-country studies may not be appropriate for MSMEs in South Africa. In any case, for stakeholders set on promoting MSMEs, only the top domestic constraints matter, and particularly the binding constraints. Before determining the binding constraints, the next section reviews the Growth Diagnostic framework, which this chapter uses.

3.4 ANALYTICAL FRAMEWORK AND DATA SOURCES

3.4.1 Analytical framework

Hausmann *et al.* (2005) provide a theoretical framework, Growth Diagnostics, to determine a binding constraint. Two arguments are implicit in the framework. The first is that for developing countries to improve the socioeconomic circumstances of citizens, economic growth is what is required the most. The second is that economic growth is context-dependent, varying from setting to setting. The framework is based on the observation that in any setting, obstacles to growth will not equally constrain i.e. some obstacles will have a greater effect than others but one, the binding constraint, will have the largest effect on growth. That binding constraint keeps growth in check. Should the binding constraint be identified and eliminated, a welfare-improving equilibrium emerges in that setting. The challenge is then twofold: identifying the binding constraint, and designing policies to eliminate it.

How then does one "sift through what may seem like a bewildering array of problems to hone in on the most likely culprits for growth failures through a combination of simple theory and suggestive

empirics"? (Rodrik, 2010: 35). The framework is not prescriptive. As discussed earlier in the chapter, Dihn *et al.* (2010) and Ayyagari *et al.* (2008) used different approaches to determine the top constraints: the former used a count of responses complemented by regression analysis, and the latter, Directed Acyclic Graph methodology. Once sifted, both used multivariate regression analysis to determine the constraint with the largest effect on growth.

It is indeed expedient to identify the most binding problem in a setting because policies can be specific in design and execution. There are, however, many reasons to be cautious in adopting a framework that singles out just one impediment in a bewildering array of many. Three reasons need particular mention. Firstly, the underlying assertion of the framework that in any setting only one constraint matters most is very restrictive. It implicitly assumes homogeneity of subjects in that setting and that the effects of the binding constraint will be about the same across all subjects.

Secondly, as Ayyagari *et al.* (2008) found, some effects of obstacles on growth can be indirect such that it is possible that a seemingly minor obstacle is responsible for what the framework diagnoses as binding. In such a situation, it is reasonable to posit that tackling the binding constraint as defined by the framework will not improve growth. Thirdly, it can be impractical for policy to attend to some binding constraint because of limited resources or because the constraint can only be eliminated over time. Crime, corruption, informality of the economy and political instability are examples.

In all the three reasons for caution, a pragmatic approach is probably to take note of the constraints whose effects are most close to that of the binding. The problem is that once the binding constraint is determined, no attention appears to be given to what would have been discarded in the sifting process. This chapter attempts to retain the framework's holistic analysis of constraints right through to the results by not quickly discarding obstacles in the sifting process. This ensures that the interpretation of the results of the frameworks is not focused solely on the most serious impediment but also on other serious challenges.

As background to the analysis, it is important to refer a study by Rodrik (2008) which sought to understand why unemployment has remained high in South Africa. Reviewing the economy over three decades, Rodrik (2008) found that unemployment is largely explained by the increasing capital intensity of the manufacturing and mining sector along with a growing financial sector, all of which shored up demand for highly skilled workers, while job opportunities for the less skilled waned. Some studies focusing only on the post-apartheid era had similar findings (Altman, 2013; Bhorat and Mayet, 2013). Rodrik (2008) shows that it is less likely that large firms will create jobs as has been the case in the past. Instead, for job creation, policies must promote new sectors and entrepreneurship (Rodrik, 2008). This affirms the need to understand obstacles to the growth of emerging enterprises.

3.4.2 Application of analytical framework

Studies have shown that MSME growth is considerably explained by firm age (Haltiwanger *et al*., 2013), the sector in which it operates (Soderbom and Teal, 2003), ownership structure such as ethnic origins and gender of owners (Kantor, 2005; Raturi and Swamy, 1999) and location (Gelb *et al.,* 2007; Aterido and Hallward-Driemeier, 2010). On the back of this literature, it is fair to expect that the effect of an obstacle on growth will likely vary across the categories of MSME such as age, sector, ownership, and location in South Africa. Accordingly, the analytical framework groups firms in the said categories. Categorising firms in this manner is also useful as policy makers often target support to specific groups.

Following previous literature such as Dihn *et al.* (2010) and Ayyagari *et al.* (2008), the analysis defines growth as the log difference in the number of full-time employees in the period prior to the survey, 2003, and the time of the survey in 2007:

$$gr_{emp_{it}} = \frac{InEmp_{it} - InEmp_{i,t-1}}{N} \quad \ldots(3.1)$$

where $gr_{emp_{it}}$ is the growth of firm *i* at time *t*, Emp_{it} is the number of its full-time employees in 2007 and $Emp_{i,t-1}$ in 2003, and N is the number of years between the two periods.

The chapter seeks to determine the binding constraints and constraints with notable effects and this is done using two approaches based on the Growth Diagnostic framework. The first approach is through four sequential stages while the second explores the effects of obstacles using a model with interaction terms. The multivariate regression models employed in the two stages enable the investigation to determine the effects of each of the 15 obstacles on growth defined in Equation 3.1. Such effects are captured by the coefficient β in each the models that are presented from Equations 3.2 to 3.5.

The first approach:

The effects of an individual obstacle on growth are first observed using the following model.

Model 1:

$$gr_{emp} = \beta_0 + \beta_{individual\ obstacle} + \beta_{firm\ characteristics} + \beta_{market\ characteristics} + \varepsilon_1 \quad \ldots(3.2)$$

where *Individual obstacle* is each of the 15 obstacles given in Section 3.5 and ε_1 is the error term. Firm characteristics include 2006 sales, number of full-time paid employees in 2003, the square of the number of full-time paid employees, firm age, the square of firm age, a dummy for whether the firm is a subsidiary, and a dummy variable for foreign ownership of the firm that is above 10 percent. MSMEs are often young in age and by definition have few employees. The square of firm age (and number of employees) is used in empirical studies (e.g. Dihn *et al.,* 2010) so as to be able to observe the potential effects of 'older' firms (and firms with more employees) on the dependent variable. Market characteristics include a dummy for direct exports above 10 percent of

sales and a dummy for the manufacturing sector. Overall, the control variables are such that the results can be compared to similar studies.

The analysis proceeds to observe the impact of all constraints on growth at once in Model 2.

Model 2:

$$gr_{emp} = \beta_0 + \beta_{\text{all 15 obstacles}} + \beta_{\text{firm characteristics}} + \beta_{\text{market characteristics}} + \varepsilon_2 \quad \ldots(3.3)$$

In the third stage, the significant constraints from Model 1 and 2 are used.

Model 3:

$$gr_{emp} = \beta_0 + \beta_{\text{only significant obstacle in Model 1 and 2}} + \beta_{\text{firm characteristics}} + \beta_{\text{market characteristics}} + \varepsilon_3 \ldots(3.4)$$

The second approach:

In the second approach, interactions between some of the groups are allowed and the top constraints are determined by estimating the following regression.

Model 4:

$$gr_{emp} = \beta_0 + \beta_{\text{interaction term}} + \beta_{\text{15 obstacles}} + \beta_{\text{firm characteristics}} + \beta_{\text{market characteristics}} + \varepsilon_4 \quad \ldots(3.5)$$

where the interaction term is each of the 15 obstacles interacting with the small and with the medium firms in turn. Results from the four earlier models, discussed in Section 3.6, compel the analysis to drop microenterprises from the interactions because of the relatively small sample.

3.4.3 Decision criteria

Results are summarised in Tables 3.4 to 3.6. For the key question asked (i.e. what is the binding constraint for enterprise growth in South Africa?), three possible outcomes from the methodology outlined above are expected. One outcome is a binding constraint for each category of firms at Model 4. The binding constraint must have a significant negative effect on growth. An obstacle is binding in Model 4 subject to the criterion given in B. below. The two other likely outcomes occur in the absence of a binding constraint. One would be when there is evidence that the effect of an obstacle on growth is negative and significant in Models 1 and 2. Such an outcome will be referred to as a *constraint with notable effects*. Another will be when there is insufficient evidence that any of the constraints affects growth in a meaningful way. On such outcomes, there are no further investigations done in this chapter but the possible implications are discussed in Section 3.7. In sum, then, the analysis and decision making criteria on what is a *binding constraint* or a *constraint with notable effect* is as follows:

First approach:

i. With reference to Model 1, the outcome is a constraint with notable effects if, in the respective category of enterprises, it is the only constraint with a significant negative impact on growth given that no other(s) emerge as significant in Model 2.

ii. With reference to Model 2, the outcome is a binding constraint if it is significant and is the only constraint that is significant given that no other constraint was found significant in Model 1. If one or more constraints are significant in Model 2 or, in addition, at least one or more from Model 1, then the binding constraint is determined by proceeding with all such significant constraints from Models 1 and 2 to Model 3.

iii. With reference to Model 3, the outcome is a binding constraint if significant. Should more than one emerge as significant then the constraint with the largest negative marginal effect on growth will be deemed the most binding and the other significant ones will be deemed constraints with notable effects.

iv. There is no reporting on categories of firms where constraints have a less than notable effect on growth.

Second Approach:

With reference to Model 4, the constraint with the most effect is determined by counting the number of times a constraint has a significant negative effect on the interaction terms. The group or category of firms most affected by an obstacle is also determined by a count of obstacles negatively affecting the group significantly.

All the models are estimated using the Ordinary Least Squares (OLS) method. OLS estimates the parameter β such that the sum of the squared residuals of the model is minimised i.e. most close to zero. The method is used by many other similar studies including Dihn *et al*. (2010) and Ayyagari *et al*. (2008).

3.5 DATA

The WBES data of 2007 in South Africa were used for the analysis. The 861 MSMEs surveyed were subject to the analysis. The 196 large firms surveyed were however included in the analysis for comparative purposes. In the WBES, firms rated 15 obstacles on a scale of 0 to 4 where 0 is no obstacle, 1 is minor, 2 moderate, 3 major, and 4 very severe. The obstacles are access to finance, access to land, business licensing and permits, corruption, courts, crime, customs and trade regulations, electricity, inadequately educated workers, labour regulations, political instability, practices of informal sector competitors, tax administration, tax rates and transportation of goods and supplies.

Since the measures of the 15 constraints are categorical, there are three alternative approaches of handling them in the analysis. One is to capture the categorical measures as they are, which would make interpretation and comprehension of results convolutedly confusing given the five categories. Another is to reduce the number of categories to for instance two, where one is ‘no obstacle’ and the other is ‘obstacle’. Interpreting results from the two categories would be straightforward but at

the loss of information in the ordered categorical ratings. The third alternative is to treat the categories as weak proxies of an otherwise continuous variable and use the resultant mean. The third alternative, used in this chapter, is adopted by Ayyagari *et al*. (2008) and Dihn *et al*. (2010).

Table 3.2 gives descriptive statistics of the obstacles and shows that on average, a micro enterprise has two employees, a small enterprise has 10 employees while a medium-sized firm has 42. When grouped by age, the sample has 325 firms that are less than six years (i.e. young firms), 360 firms with ages from 6 and 15 (mature firms) and 370 firms that are more than 15 years (i.e. old firms). Only 23.6 percent of the firms surveyed had women owners. With regard to the obstacles encountered by the firms, the average ratings suggest that crime with a mean of 1.95 would be the most serious obstacle to growth, as was indeed shown by the count-based results in Section 3.3.

Table 3.2: Variables descriptions and summary statistics

Variable	Description	Obs.	Min	Max	Mean	SD
Micro	Number of employees	120	1	4	2.2833	1.2243
Small	Number of employees	375	5	20	10.0930	4.4950
Medium	Number of employees	366	21	99	41.9290	21.6650
Large	Number of employees	196	100	9600	426.4850	979.344
Firm age	2007 minus the year firm begun operating in South Africa	1056	1	141	15.9290	17.7736
Young	Up to 5 years	325	1	5	2.8369	1.5359
Mature	Between 6 and 15 years	360	6	15	9.5278	2.8105
Old	Above 15 years	370	16	141	33.6092	19.6763
Experience	How many years of experience working in this sector does the top manager have?	1056	1	61	13.7311	10.7040
Gender	Dummy for female ownership	847	0	1	0.2361	0.4250
Access to finance	How much of an obstacle access to and cost of finance is to the firm's operations	860	0	4	0.8826	1.2569
Access to land	How much of an obstacle access to land is to the firm's operations	860	0	4	0.5884	1.0877
Licensing	How much of an obstacle issuing of business licencing/permits is to the firm's operations	860	0	4	0.4349	0.8814
Corruption	How much of an obstacle corruption is to the firm's operations	860	0	4	0.9570	1.2393
Courts	How much of an obstacle functioning of courts is to the firm's operations	860	0	4	0.1953	0.5921
Crime	How much of an obstacle crime, theft and disorder are the firm's operations	860	0	4	1.9547	1.2817
Customs & trade	How much of an obstacle customs and trade regulations are to the firm's operations	860	0	4	0.2105	0.6281
Electricity	How much of an obstacle electricity is to the firm's operations	860	0	4	1.1395	1.3273
Inadequately educated workers	How much of an obstacle inadequately educated workers are to the firm's operations	860	0	4	0.6349	1.0025
Labour regulations	How much of an obstacle labour regulations are to the firm's operations	860	0	4	0.5058	0.9098
Political instability	How much of an obstacle political instability is to the firm's operations	860	0	4	0.2733	0.7180
Informal sector	How much of an obstacle are practices of informal competitors to the firm's operations	859	0	4	0.8312	1.1356
Tax administration	How much of an obstacle tax administration is to the firm's operations	860	0	4	0.2593	0.6868
Tax rates	How much of an obstacle tax rates are to the firm's operations	859	0	4	0.4144	0.8518
Transportation	How much of an obstacle is transportation of goods and services to the firm's operations	860	0	4	0.5163	0.9399
Sales (annual)	Recent annual sales	859	7,200	328,000,000	10,300,000	25,700,000
Employees in 2003	Number of employees in 2003	694	0	150	20.9798	21.7520
Foreign ownership	Dummy for ownership above 10 percent	859	0	1	0.0873	0.2825
Export	Dummy for direct exports above 10 percent	859	0	1	0.0477	0.2133

Source: Author's estimations based on the World Bank Enterprise Surveys of South Africa (2007)

Table 3.3 summarises statistics of the 861 MSMEs by age, sector, ownership, and location. Like Dihn *et al.* (2010), an employment-based measure of growth is used rather than the sales-based measure as the latter is more volatile. Table 3.3 shows that young firms (up to 5 years old) have the highest growth rate of 9.6 percent, while old firms (more than 15 years) have the lowest at 6.4 percent. Old firms however have the lowest standard deviation, indicating that the growth rates are more stable. The definition of firm age categories is rather arbitrary in the literature. Following Aterido *et al*. (2011), this study defines 'young' as being up to 5 years (OECD, (2013) similarly defines young firms), 'mature' as 6 to 15 years and 'old' as more than 15 years. Aterido *et al*. (2009) also show higher performance of young firms.

Table 3.3: Employment growth rates by enterprise category

Category		Obs.	Mean	Std. Dev.	Min	Max
	All	883	0.0761	0.1047	-0.7068	0.5973
	Large firms	193	0.0611	0.1053	-0.7068	0.4176
	MSMEs	690	0.0803	0.1042	-0.2310	0.5973
Size	Micro	68	0.0216	0.1104	-0.2310	0.4621
	Small	281	0.0936	0.1090	-0.1959	0.5973
	Medium	341	0.0811	0.0947	-0.2310	0.4851
Age	Young	147	0.0960	0.1076	-0.2310	0.3662
	Mature	304	0.0854	0.1093	-0.2310	0.5973
	Old	239	0.0642	0.0930	-0.2310	0.4176
Sector	Retail	171	0.0646	0.1053	-0.2310	0.5973
	Services	156	0.0759	0.1034	-0.1865	0.5365
	Manufacturing	361	0.0892	0.1032	-0.2310	0.4851
Region	Cape Town	96	0.0712	0.1057	-0.2310	0.3662
	Durban-Port Elizabeth	135	0.1107	0.0958	-0.0278	0.5365
	Johannesburg	391	0.0823	0.1013	-0.1959	0.5973
Ownership	African	234	0.0858	0.1128	-0.2310	0.4851
	Asian & other	188	0.0808	0.1048	-0.2310	0.5973
	European	268	0.0752	0.0957	-0.2310	0.5365
	Female	149	0.0756	0.1083	-0.1865	0.5365
	Male	530	0.0812	0.1034	-0.2310	0.5973

Source: Author's estimations based on World Bank Enterprise Surveys, South Africa (2007)

3.6 EMPIRICAL RESULTS ON BINDING CONSTRAINTS AND GROWTH

Section 3.4 outlined the stages of the analysis and the decision criteria in interpreting the results. The results of the first approach within the Growth Diagnostic framework are presented in full from Appendices 1 to 9 and summarised in Table 3.4. Table 3.5 summarises the marginal effects of the binding constraints. Section 3.6.1 discusses the results of the first approach and Section 3.6.2 discusses the results from the second approach.

3.6.1 The binding constraints: first approach

Except for small firms of European ownership and firms in Cape Town, access to finance does not impact the growth of MSMEs significantly. These results on access to finance are rather unexpected given extensive empirical evidence globally finding this obstacle as the main impediment. The count-based ratings in Section 3.3 showed that access to finance is however one of the top four obstacles. Chapter 4 will thus explore access to finance in some detail to understand why or if indeed the problem is less important in South Africa.

The analysis does not find a binding constraint in the full sample of firms that includes 196 large enterprises. When the large firms are dropped from the analysis, leaving the 861 MSMEs, some significant growth obstacles emerge. Excluding large firms also improves the quality of the results, with the adjusted R-squared improving from an average of 4 percent for all firms on the 15 individual regressions of Model 1 to 78 percent for micro enterprises. Of the 17 enterprise subgroups studied in the five categories shown in Table 3.2, it is in the full sample of MSMEs, the medium, young and male-owned firms that the search for a binding constraint progressed to Model 3. For the four categories, ‘courts’ is the binding constraint. For young firms, individual obstacles regressions of Model 1 found only courts significant. However when all obstacles entered the regression at once, the practices of competitors in the informal sector emerged as the only significant problem. With two constraints for young firms, the analysis proceeded to Model 3 entering courts and practices of competitors in the informal sector in the regression. Courts emerged as significant. All else held constant, there is basis from this analysis to infer that the courts reduces the propensity of young firms to increase employment, on average, 2.83 percent as shown in the average marginal effects in Table 3.5.

Black-owned firms have the highest growth rates and for these firms, tax administration is binding, reducing the likelihood of increasing employment by, on average, 3.13 percent with all else held constant. MSMEs in the retail sector have licensing and permits as a binding constraint. Practices of competitors in the informal sector are the binding constraint for Asian-owned firms. Electricity is the binding constraint for firms in Johannesburg. For MSMEs as a whole, the first approach shows that courts is the binding constraint and transport and electricity are constraints with notable effects.

Table 3.4: Obstacles that constrain MSMEs' growth the most in South Africa

Firms' categories		Courts	Electricity	Business licensing and permits	Practices of informal sector competitors	Tax Admin	Transport	Constraints with notable effects	Most binding constraint
ALL			-0.007 (0.021)*						Electricity
MSMEs		-0.012 (0.037)*	-0.006 (0.036)*				-0.010 (0.023)*	Electricity Transport	Courts
Size	Medium	-0.009 (0.055)	-0.006 (0.033)*					Electricity	Courts
	Young	-0.028 (0.031)			-0.023 (0.012)*		-0.019 (0.052)	Informal competition	Courts
Sector	Retail			-0.022 (0.039)*			-0.017 (0.085)	Transport	Licensing
Region	Jo'burg		-0.007 (0.045)*						Electricity
Owner	Male	-0.011 (0.074)	-0.007 (0.039)*				-0.009 (0.049)*		Courts
	African					-0.031 (0.025)*			Tax administration
	Asian				-0.018 (0.012)*				Informal competitors

* Significant at the 5 percent level

Note: Table 3.4 summarises the estimations which are reported in full in Appendices 1 to 9. Appendices 1 to 9 report the effects of obstacles on growth from 3 Models. The summary in the above Table 3.4 reports only obstacles found significant when estimated in Model 1 where a single obstacle along with firm and market characteristics are estimated, Model 2 when all obstacles enter the regression at once along with firm and market characteristics and Model 3 when only significant obstacles from Model 1 and 2 are estimated along with firms and market.

Source: Author's estimations based on World Bank Enterprise Surveys of South Africa (2007)

Table 3.5: Marginal effects of the binding constraints

Average marginal effects
Model VCE: OLS
Expression: Linear prediction, predict ()
dy/dx w.r.t: binding constraint

Enterprise group	Binding constraint	dy/dx	Std. Err.	Delta method z	P> | z |	[95% Conf.	Interval]
ALL	Electricity^	-0.0069	0.0030	-2.3100	0.0210	-0.0127	-0.0010
Johannesburg MSMEs	Electricity^	-0.0074	0.0037	-2.0100	0.0440	-0.0147	-0.0002
All MSMEs	Courts*	-0.0118	0.0057	-2.0900	0.0360	-0.0229	-0.0008
Medium	Courts*	-0.0085	0.0044	-1.9300	0.0540	-0.0172	0.0001
Young	Courts*	-0.0283	0.0130	-2.1900	0.0290	-0.0537	-0.0029
Male-owned	Courts*	-0.0114	0.0064	-1.7900	0.0730	-0.0238	0.0011
African-owned	Tax administration^	-0.0313	0.0138	-2.2600	0.0240	-0.0585	-0.0042
Asian-owned	Practices of informal sector competitors^	-0.0183	0.0072	-2.5400	0.0110	-0.0324	-0.0042
Retail	Business licensing and permits^	-0.0216	0.0104	-2.0800	0.0370	-0.0419	-0.0013

^ Marginal effect estimated at Model 2 stage where all obstacles enter the regression at once

* Marginal effect estimated post model 3 where only significant obstacles from Models 1 and 2 enter the regression

Source: Author's estimations based on World Bank Enterprise Surveys of South Africa (2007)

3.6.2 Top constraints: second approach

The second approach studies the interaction terms. Ideally, interactions would include all five groups (size, age, sector, location, gender and ethnic origin) and subgroups. However, a sample of 861 is too small to allow for all possible interactions. The analysis designates firm size as the key variable of interest. Interaction terms are thus firm size with each of the other categories' subgroups. Micro enterprises are largely homogenous: all are from one locality, 80 percent are black-owned and three-quarters are retailers. Interacting micro enterprises with other groups would yield limited observations. The second approach excludes micro enterprises.

Table 3.6 reports the effects of each obstacle as it interacts with small or with medium firms and one of the subgroups (i.e. young, old, services, etc.). Table 3.6 provides interesting reading in two main ways. Firstly, the effects of each obstacle can be observed across different categories of firms. For instance, the obstacle 'courts' is the only obstacle with a negative coefficient across all categories. However, the effect is not significant for medium firms. If results on access to finance are reviewed across the category of firms, it can be seen that the obstacle is significant in two of the 14 interaction terms (i.e. white-owned and Cape Town-based small firms). As previously stated, Chapter 4 conducts a detailed investigation of access to finance. It may therefore suffice for now to postulate that perhaps the fact that enterprise development policy in South Africa seeks to support mainly black- and Indian-owned firms has left white-owned small firms most vulnerable to the finance constraint (White Paper, 1995; DTI, 2005; NPC, 2011). Even then, the importance of a careful study of access to finance is further underscored by the fact that the effect of access to finance on growth is negative for all small firms except the black-owned.

Secondly, the effects of all obstacles can be observed on each group. For example, the first column of Table 3.6 shows the effects of each obstacle on young small firms where only 'practices of competitors in the informal sector' is significant. For small firms in Durban and Port Elizabeth, the results show that all 15 obstacles have no significant effect on growth. One of the many plausible explanations is that the survey instrument did not pick up key issues affecting growth. On the other hand, 9 of the 15 obstacles affect the retail, Asian-owned and Johannesburg-based small firms. If interventions are to target the most affected firms, then this result suggests that the preceding three groups would deserve more attention. But this may be debatable. For instance, male-owned small firms are significantly affected by 8 out of the 15 obstacles, while only three are significant for female-owned small firms despite the fact that many studies have shown that female-owned firms face more obstacles. A possible explanation for this is that only 23.6 percent of firms in the sample were female-owned. That the proportion of female-owned firms was less than half the proportion of women in the national population suggests that there could be significant obstacles women face in starting their own businesses. Further research into such gender-related obstacles is therefore necessary so that suitable policies are designed and implemented.

Table 3.6: Interactions for each obstacle

	Young		**Mature**		**Old**		**Retail**		**Manufacturing**		**Services**	
	Small	Medium	Small	Medium	Small	Medium	Small	Medium	Small	Medium	Small	Medium
Access to finance	-0.010	0.015	-0.005	0.015	-0.011	0.006	-0.012	0.024	-0.012	0.007	-0.006	0.012
	0.154	*0.106*	*0.408*	*0.007*	*0.154*	*0.371*	*0.226*	*0.043*	*0.153*	*0.343*	*0.191*	*0.014*
Access to land	-0.011	0.011	-0.002	0.018	0.007	0.010	-0.011	0.012	-0.023	0.007	0.008	0.018
	0.177	*0.378*	*0.792*	*0.003*	*0.430*	*0.132*	*0.315*	*0.207*	*0.039**	*0.330*	*0.242*	*0.002*
Licensing & permits	-0.002	0.023	-0.005	0.015	-0.009	0.003	-0.031	0.015	0.003	0.018	-0.001	0.009
	0.892	*0.070*	*0.585*	*0.079*	*0.426*	*0.809*	*0.023**	*0.361*	*0.835*	*0.122*	*0.947*	*0.265*
Corruption	-0.007	0.018	-0.003	0.010	-0.017	0.002	-0.012	0.011	-0.019	0.002	-0.002	0.010
	0.266	*0.037*	*0.530*	*0.034*	*0.012**	*0.631*	*0.066*	*0.087*	*0.015**	*0.730*	*0.661*	*0.024*
Courts	-0.036	-0.026	-0.025	-0.002	-0.031	0.002	-0.056	0.001	-0.030	-0.011	-0.017	0.000
	0.273	*0.104*	*0.151*	*0.854*	*0.042**	*0.850*	*0.017**	*0.953*	*0.139*	*0.322*	*0.251*	*0.983*
Crime	-0.006	0.013	-0.010	0.008	-0.012	0.002	-0.013	0.004	-0.017	0.002	-0.002	0.012
	0.164	*0.012*	*0.007**	*0.022*	*0.008**	*0.632*	*0.001**	*0.359*	*0.000**	*0.589*	*0.681*	*0.000*
Customs regulations	-0.014	-0.023	-0.041	0.007	-0.030	0.013	-0.019	0.025	-0.051	0.009	-0.026	0.002
	0.304	*0.217*	*0.017**	*0.579*	*0.092*	*0.103*	*0.277*	*0.099*	*0.073*	*0.527*	*0.026**	*0.773*
Electricity	-0.005	-0.001	-0.015	0.004	-0.015	0.003	-0.024	0.001	-0.018	0.002	-0.007	0.005
	0.428	*0.944*	*0.002**	*0.422*	*0.011**	*0.482*	*0.017**	*0.878*	*0.001**	*0.705*	*0.106*	*0.199*
Workers' education	-0.005	0.003	-0.011	0.013	-0.030	0.005	-0.036	0.007	-0.031	0.003	-0.005	0.012
	0.580	*0.793*	*0.176*	*0.020*	*0.004**	*0.385*	*0.012**	*0.330*	*0.011**	*0.708*	*0.449*	*0.016*
Labour regulations	-0.009	0.006	-0.005	0.017	-0.016	0.010	-0.024	0.003	-0.015	0.008	0.001	0.017
	0.458	*0.692*	*0.441*	*0.003*	*0.065*	*0.148*	*0.014**	*0.781*	*0.106*	*0.262*	*0.850*	*0.001*
Political instability	-0.019	0.007	0.002	0.029	-0.021	0.004	-0.045	0.019	0.004	0.006	-0.014	0.019
	0.150	*0.634*	*0.827*	*0.004*	*0.039**	*0.629*	*0.145*	*0.207*	*0.833*	*0.522*	*0.056*	*0.038*
Informal sector	-0.029	-0.003	-0.006	0.007	-0.013	0.011	-0.017	0.015	-0.021	0.003	-0.009	0.006
	*0.002**	*0.747*	*0.308*	*0.215*	*0.079*	*0.083*	*0.046**	*0.056*	*0.035**	*0.731*	*0.077*	*0.276*
Tax administration	-0.004	-0.005	-0.026	0.010	-0.024	0.013	-0.042	0.014	0.010	0.011	-0.017	0.008
	0.805	*0.777*	*0.211*	*0.245*	*0.093*	*0.151*	*0.035**	*0.276*	*0.645*	*0.408*	*0.183*	*0.333*
Tax rates	-0.001	0.006	0.007	0.009	-0.040	0.008	-0.031	0.014	-0.011	0.004	0.000	0.011
	0.965	*0.615*	*0.529*	*0.206*	*0.002**	*0.265*	*0.046**	*0.220*	*0.426*	*0.628*	*0.999*	*0.100*
Transport	-0.021	0.019	-0.015	0.002	-0.025	0.006	-0.053	0.004	-0.028	0.005	-0.009	0.007
	0.108	*0.212*	*0.041**	*0.768*	*0.023**	*0.348*	*0.00**	*0.688*	*0.020**	*0.474*	*0.193*	*0.288*

P-values in italics

Model: Employment Growth = $\beta_0 + \beta$ log of sales + number of employees + number of employees squared + firm age + firm age squared + foreign ownership + export + size + 15 obstacles + one obstacle#size(small or medium) + selected firm

Source: Author's estimations based on World Bank Enterprise Surveys of South Africa (2007)

Table 3.6 continued: Interactions for each obstacle

	Female		**Male**		**African**		**European**		**Cape Town**		**Durban and Port Elizabeth**		**Johannesburg**	
	Small	Medium	Small	Medium	Small	Medium	Small	Medium	Small	Medium	Small	Medium	Small	Medium
Access to finance	-0.011	0.005	-0.007	0.016	0.001	0.014	-0.012	0.008	-0.022	0.014	-0.024	0.007	-0.004	0.026
	0.113	*0.442*	*0.159*	*0.001*	*0.808*	*0.038*	*0.053*	*0.216*	*0.012**	*0.036*	*0.015**	*0.528*	*0.856*	*0.003*
Access to land	-0.005	0.005	-0.002	0.019	-0.002	0.012	-0.016	0.011	0.020	0.019	-0.013	0.021	0.005	0.026
	0.622	*0.474*	*0.745*	*0.000*	*0.782*	*0.049*	*0.122*	*0.164*	*0.178*	*0.019*	*0.401*	*0.117*	*0.785*	*0.001*
Licensing & permits	-0.002	0.020	-0.008	0.008	0.008	0.016	-0.054	0.013	-0.007	0.009	-0.019	0.022	0.221	0.016
	0.887	*0.023*	*0.280*	*0.382*	*0.334*	*0.076*	*0.00**	*0.243*	*0.626*	*0.458*	*0.286*	*0.388*	*0.000*	*0.315*
Corruption	-0.019	0.003	-0.008	0.009	0.004	0.009	-0.015	0.005	-0.008	0.008	-0.003	0.006	-0.003	0.014
	*0.043**	*0.688*	*0.074*	*0.011*	*0.648*	*0.129*	*0.004**	*0.252*	*0.208*	*0.086*	*0.758*	*0.513*	*0.649*	*0.008*
Courts	-0.032	0.001	-0.029	-0.006	-0.093	-0.002	-0.046	-0.004	-0.023	-0.005	-0.051	0.001	-0.077	0.008
	0.104	*0.947*	*0.025**	*0.436*	*0.047**	*0.888*	*0.123*	*0.718*	*0.057*	*0.612*	*0.105*	*0.955*	*0.177*	*0.631*
Crime	-0.010	0.003	-0.012	0.009	-0.007	0.008	-0.010	0.005	-0.012	0.006	-0.015	0.008	0.000	0.013
	0.069	*0.463*	*0.000**	*0.003*	*0.112*	*0.043*	*0.006**	*0.151*	*0.006**	*0.065*	*0.011**	*0.183*	*0.970*	*0.001*
Customs regulations	-0.056	0.019	-0.024	0.004	-0.028	0.006	-0.030	0.002	-0.019	0.014	-0.014	0.034	-0.008	0.006
	*0.048**	*0.147*	*0.015**	*0.580*	*0.039**	*0.796*	*0.075*	*0.805*	*0.297*	*0.146*	*0.278*	*0.041*	*0.732*	*0.581*
Electricity	-0.006	0.001	-0.016	0.005	-0.011	0.000	-0.018	0.002	-0.008	0.006	-0.012	0.001	0.016	0.015
	0.310	*0.911*	*0.000**	*0.214*	*0.022**	*0.991*	*0.002**	*0.655*	*0.217*	*0.178*	*0.088*	*0.781*	*0.119*	*0.025*
Workers' education	-0.015	0.006	-0.014	0.010	-0.010	0.010	-0.029	0.006	-0.010	0.008	-0.016	0.003	0.002	0.022
	0.228	*0.405*	*0.022**	*0.023*	*0.301*	*0.177*	*0.007**	*0.352*	*0.223*	*0.116*	*0.132*	*0.702*	*0.836*	*0.004*
Labour regulations	0.002	0.008	-0.013	0.015	-0.008	0.014	-0.025	0.005	0.004	0.015	-0.016	0.011	0.005	0.022
	0.833	*0.341*	*0.019**	*0.002*	*0.594*	*0.158*	*0.001**	*0.495*	*0.587*	*0.004*	*0.149*	*0.293*	*0.595*	*0.001*
Political instability	-0.007	0.011	-0.014	0.017	-0.006	0.003	-0.035	0.012	0.019	0.019	-0.027	0.014	0.006	0.025
	0.594	*0.341*	*0.061*	*0.028*	*0.595*	*0.824*	*0.00**	*0.265*	*0.157*	*0.025*	*0.019**	*0.283*	*0.650*	*0.007*
Informal sector	-0.001	0.003	-0.017	0.009	-0.001	0.007	-0.026	0.001	-0.011	0.011	-0.024	0.011	0.013	0.014
	0.946	*0.669*	*0.000**	*0.063*	*0.893*	*0.315*	*0.000**	*0.917*	*0.215*	*0.051*	*0.019**	*0.422*	*0.203*	*0.061*
Tax administration	-0.016	0.007	-0.023	0.011	-0.037	0.003	-0.002	0.012	-0.019	0.013	-0.014	0.014	-0.011	0.019
	0.336	*0.524*	*0.075*	*0.145*	*0.024**	*0.761*	*0.884*	*0.185*	*0.340*	*0.237*	*0.395*	*0.199*	*0.653*	*0.087*
Tax rates	-0.050	0.001	0.001	0.012	-0.008	0.013	-0.006	0.011	-0.012	0.001	-0.008	0.010	-0.015	0.019
	*0.002**	*0.884*	*0.890*	*0.027*	*0.468*	*0.074*	*0.571*	*0.189*	*0.351*	*0.901*	*0.547*	*0.335*	*0.439*	*0.025*
Transport	-0.019	-0.001	-0.020	0.009	0.003	0.008	-0.042	0.002	-0.025	0.007	-0.026	0.013	-0.009	0.014
	0.088	*0.918*	*0.003**	*0.117*	*0.772*	*0.420*	*0.000**	*0.835*	*0.010**	*0.299*	*0.020**	*0.282*	*0.526*	*0.125*

P-values in italics

Model: Employment Growth = $\beta_0 + \beta$ log of sales + number of employees + number of employees squared + firm age + firm age squared + foreign ownership + export + size + 15 obstacles + one obstacle#size(small or medium) + selected firm

Source: Author's estimations based on World Bank Enterprise Surveys of South Africa (2007)

Figures 3.3 and 3.4 summarise Table 3.6 to expound on the results. Figure 3.3 reports the number of times each obstacle has a negative effect on growth and the number of times when the negative effect is significant. Crime, for instance, has negative effects 13 times and is significant in 9, while Access to land is only significant in 1 out of the 10 negative effects. Although access to land is a topical issue in South Africa, the results of this analysis suggest that it is not a critical problem. An explanation of this result could be that the enterprises surveyed were in urban centres where availability of rental offices and factories is more important than access to land.

In essence, Figure 3.3 is a ranking of the importance of obstacles for the pooled 28 interaction terms reported in Table 3.6. Based on the count of significant negative effects, the top obstacles for the pooled 28 interaction terms are Crime, Transport and Electricity. Crime was the top obstacle in the simple count of ratings method and in the weighted count approach. Crime and Transport have 9 significantly negative effects from the 13 and 14 negative effects respectively.

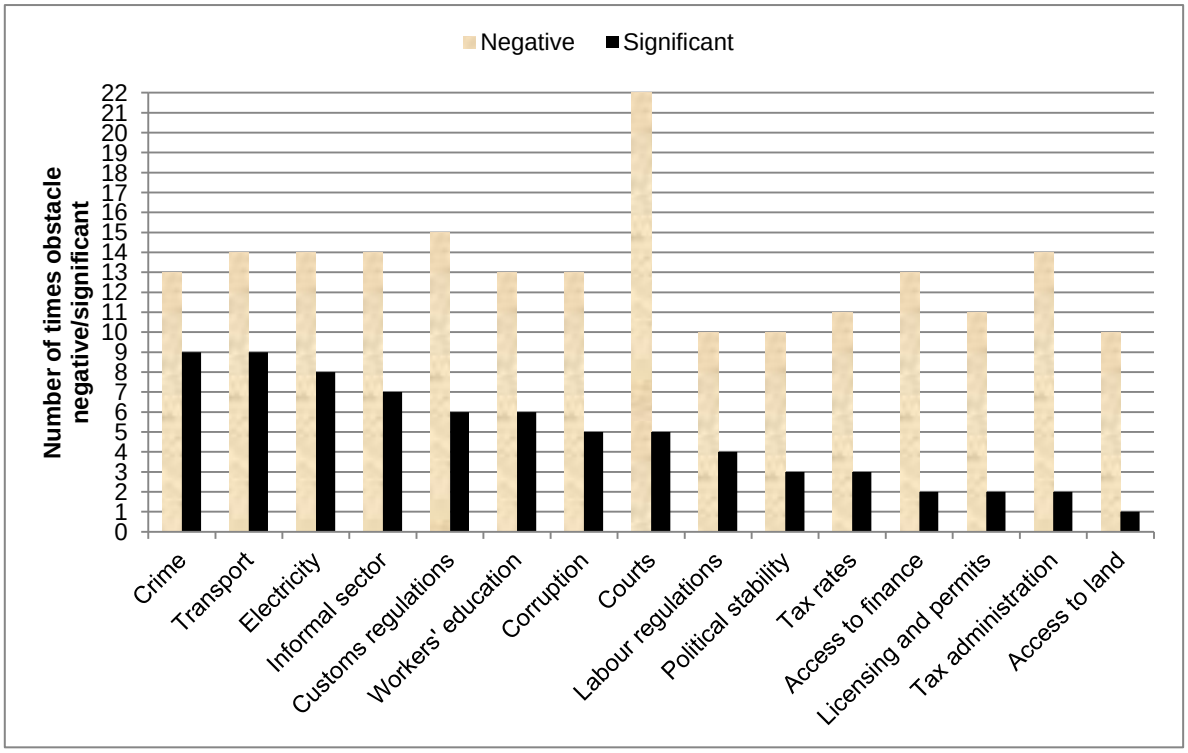

Figure 3.3: Ranking obstacles based on effects of interaction terms

It is important to determine which groups as represented by the interaction terms are most impacted by the obstacles so that interventions can be appropriately targeted. Figure 3.4 reports the number of times each group is negatively affected by obstacles and the number of times when such effects are significant. It is quite clear from Figure 3.4 that medium-sized firms are mildly affected by the obstacles studied. However, small firms are seriously affected, particularly when in the Retail sector, Asian-owned, in Johannesburg, Old or in the Services sector. For small firms in the Retail sector all 15 obstacles negatively affect growth and 10 of such effects are significant.

Similarly, for small Asian-owned and small firms in Johannesburg, all 15 obstacles negatively affect growth and 9 of such effects are significant. Interventions directed at these types of firms may unlock the job creation potential of small firms. Based on the summary in Figure 3.3, the previous analyses of Model 1 to 3 summarised in Table 3.5 and the simple and weighted count methods summarised in Figure 3.1 and Table 3.1 suggest that the most appropriate intervention must seek to mitigate crime, improve transportation of goods and the supply of electricity. These are the main impediments to the growth of MSMEs in South Africa.

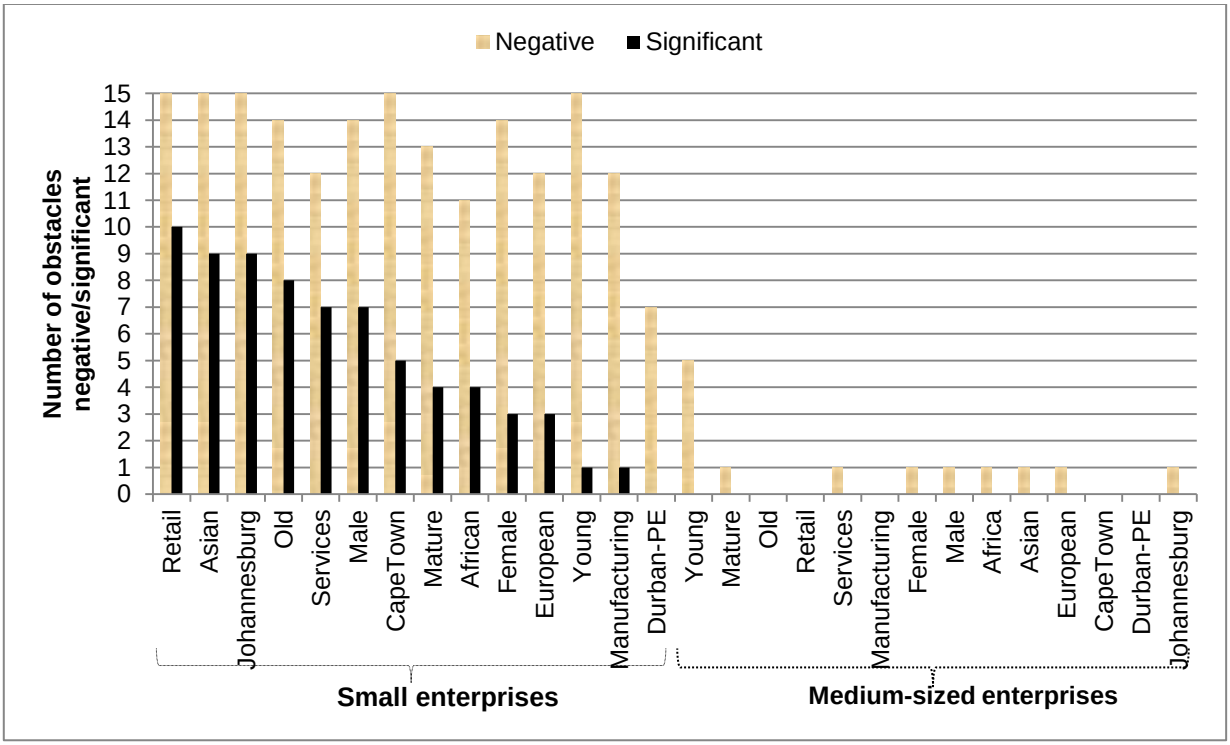

Figure 3.4: Ranking of obstacles by interaction terms

The analyses of Models 1 to 3 found that Courts is the most binding constraint. It is probably important to note that Dihn *et al*. (2010) found the practices of informal competitors and access to finance as the most serious constraints but raised two arguments against the practices of competitors in the informal sector. The first pointed out that the survey instrument lacks objective indicators to validate the obstacle, and the second reasoned that competition, as the essence of enterprise, is not an obstacle. In that light, practices of informal sector competitors is a rather ambiguous constraint, as is 'courts'. Courts relates to the legal system, its perceived and real efficiency[4]. This is too broad to relate to enterprise growth unless specific aspects of the law specified for evaluation by firms. Finding courts binding is of limited use to legal reform and design of support measures. It may therefore be useful for the WBES instrument and future studies to explore specific aspects of the broad 'courts' variable which affect growth negatively.

[4] Instead of courts, World Bank Business Environment Surveys (1999-2000) had legal obstacles on its list.

One way of dealing with an ambiguous binding constraint such as courts is to opt for the second most serious based on marginal effects on growth. This would certainly be justifiable in other contexts but for South Africa, it is more reasonable to associate courts with crime - and crime is the top constraint in all other analyses of this chapter. It is thus important to be cognisant of the possibility that the effects of crime on growth may also have an indirect effect through courts. However, the question of how constraints relate and influence each other is beyond the scope of this chapter but an important issue for further research. It suffices for this discussion to postulate that a lax legal system increases crime, limits entrepreneurship and keeps stakeholders such as insurance companies away. It also important to consider the firms' interpretation of 'crime, theft and disorder' in the questionnaire as the interpretation informs where interventions are most required. Three further questions in the survey instrument offer some guidance on this as summarised in Table 3.7. The questions relate to goods-in-transit security and security of physical assets within the firm.

Table 3.7: What could crime, and disorder mean?

Percentage of firms reporting that:		
1	Shipments to customers were lost to theft	82%
2	Firm paid for security for equipment, personnel, or professional security services	69%
3	Firm experienced losses as a result of theft, robbery, vandalism or arson	42%

Source: World Bank Surveys in South Africa (2007)

Table 3.7 suggests that the provision of secure transportation of products to the market could mitigate the effects of crime, further affirming transport as one of the main obstacles to growth.

3.7 IMPLICATIONS FOR POLICY

This chapter used two count-based methods that summarise the feedback of how business owners rated the severity of 15 obstacles on their enterprises and two approaches based on the Growth Diagnostic framework by Hausmann *et al.* (2005) to identify, rank and determine the most serious obstacles to the growth of MSMEs. Evidence in the chapter suggests that crime is the binding constraints for the MSMEs. However, the obstacles studied do not significantly affect medium-sized enterprises but small firms. Although medium-sized firms are mildly affected, it is important to note that five obstacles (Courts, Customs and regulations, Electricity, Informal sector competitors and Tax administration) have a negative effect on young medium firms. All obstacles have negative effects on young small firms. This suggests that young firms are most vulnerable to business environment challenges. Interventions that seek to impart general business management skills to proprietors of new business ventures would be helpful to young firms.

There are some enterprises where the impact of all obstacles on growth was below *constraints with notable effects*. The affected categories prior to the second Growth Diagnostics approach were micro, small, old, female-owned and European-owned, services and manufacturing sector, Cape Town, Durban and Port Elizabeth-based. There are two possible interpretations of this outcome. The first is that the firms have no significant obstacle constraining their growth, meaning that the business environment should be tenable for them. In this interpretation, firms are only exposed to the typical systemic challenges of being in enterprise, namely the ability to innovate and being competitive. The other interpretation is that it is possible that the hypothetical obstacles presented to business owners and managers in the survey instrument did not capture obstacles peculiar to such firms. However, considering additional characteristics of the firms as in the second approach within the Growth Diagnostics framework by creating interaction terms identifies impediments to growth. Considering interaction terms therefore provides incremental insight to policy when designing interventions to considering only a singular trait of a firm.

This chapter used the 2007 World Bank Enterprise Survey data. In preparation for the 2010 FIFA World Cup in South Africa, substantial infrastructure projects to improve the transport system and electricity supply were undertaken nationwide. It is likely that the relative importance of some of the obstacles may well have changed because of these projects and other policies since. A survey and analysis of the 15 and perhaps more obstacles would be invaluable as it would not only show the evolving issues of MSME growth but further enrich the debate on whether there are economic benefit to hosting such events (Maennig and du Plessis, 2007; Rogerson, 2009). This chapter developed an analytical framework that can be utilised in such future surveys to identify, rank and determine the most important obstacles in a given context.

3.8 CONCLUSION

The chapter identified key constraints to the growth of MSMEs and determined the most binding. The chapter presented a criterion for identifying top constraints as an alternative to the simple count of responses approach often used in the literature. Using this alternative weighted count approach, crime, electricity and corruption were found to be the top constraints. The chapter also used two Growth Diagnostics based methods to determine binding and top constraints and grouped firms by size, age, sector, ethnic and gender ownership and location to determine such constraints for each group. The binding constraint for MSMEs as a whole is crime, theft and disorder. Electricity and transportation of goods are constraints with notable effects on growth and quite important across all firm groups. Access to finance has limited effects on most MSMEs and is further investigated in the next chapter given the prominence of the problem in empirical literature in South Africa and in the developing world.

CHAPTER 4: THE FINANCE CONSTRAINT AND MICRO, SMALL AND MEDIUM ENTERPRISE DEVELOPMENT IN SOUTH AFRICA

4.1 INTRODUCTION

Access to finance is regarded as one of the key determinants of whether a business idea is explored commercially in a start-up venture (Demirgüç-Kunt and Levine, 2008). Similarly, the availability of working capital and long-term finance determines the continued existence and growth of the venture. There is extensive empirical evidence globally that the main obstacle to the growth of MSMEs is access to finance (Ayyagari *et al*., 2007; Beck *et al.*, 2008; G20, 2010). The evidence underscores the importance of studying the profile of financially constrained firms so that policy interventions can target such firms.

A number of studies on MSMEs in South Africa have argued that finance is the main constraint to growth (DTI, 2005; Naidoo and Hilton, 2006; Rogerson, 2008). Others show through feedback from surveys that most business owners rate access to finance as a major obstacle (Garwe and Fatoki, 2012; Fatoki and Garwe, 2010; Naudé *et al*., 2008; Gumede, 2004; Fatoki and Smit, 2011). Naudé *et al.* (2008) for instance used the Global Entrepreneurship Monitor survey data and found that access to finance is a major determinant of start-up rates in South Africa. Gumede (2004) used a national survey and found that along with access to information about international markets, access to finance plays a significant role in determining the propensity of SMEs to be exporters. Fatoki and Garwe (2010) surveyed MSMEs in the Eastern Cape province and employed factor analysis to identify key obstacles to starting a business and found access to finance to be the main obstacle.

Although numerous other obstacles to the growth of MSMEs have been highlighted in South Africa[5], the finance constraint features prominently (as it does globally) as the key obstacle to growth. The prominence of access to finance in the small enterprise development literature makes it reasonable to be cautious towards intimations as in Chapter 3 that finance may not be the most serious obstacle for MSMEs in South Africa.

Through three systematic stages, this chapter seeks to understand the access to finance problem in South Africa using the WBES of 2003 and 2007 and the WBFCS of 2010. First, the chapter

[5] For example Nieman, Visser and van Wyk (2008) found that for SMEs in the tourism sector, government policies and perceptions of the country internationally are more important. In investigating why some SMEs grow while others stagnate or fail, Unger, Keith, Hilling, Gielnik and Frese (2009) found that the cognitive ability of entrepreneurs and their level of education are the main determinants of success, a finding related to Visser *et al*. (2005) who showed that formal education enhances transformational leadership in SMEs. Ladzani and van Vuuren (2002) and Lotz and Marais (2007) underscored the importance of training before entrepreneurs set up their businesses.

determines the importance of the finance constraint over time by tracking opinions of business owners and managers on how they regarded access to finance issues as affecting enterprise operations. Second, the chapter assesses whether firms run by managers who regard access to finance as a serious obstacle significantly underperform firms run by managers who regard access to finance as not being a serious obstacle. The second stage is an important contribution in that the extant literature has largely not demonstrated the implied disadvantage of firms that rate access to finance as a problem.

While the first two stages use a perceptions-based measure of the finance constraint, the third uses a framework by Kuntchev *et al*., (2013) to identify firms that actually encounter obstacles when seeking finance. Once identified, the third stage seeks to understand the profile of financially constrained firms by investigating their attributes, for example the sectors in which most are found, whether such firms are start-ups or mature, managed by very educated or less educated executives, owned by blacks or whites etc. Understanding the profile of financially constrained firms is important in that policies can target such firms rather than the generality of enterprises.

The next section reviews theoretical explanations for why smaller firms encounter more obstacles than larger firms in accessing finance. It also reviews the empirical literature to assess how the finance constraint has been measured.

4.2 LITERATURE REVIEW

Information asymmetry (Stiglitz and Weiss, 1981; Akerlof, 1970) and transaction costs economics (Williamson, 1981; 2007) provide useful theoretical rationalisations that, when applied to the small business sector (Honohan, 2010; Besley, 1994), explain why small firms find it difficult to access production inputs from factor markets. Finance, as Demirgüç-Kunt and Levine (2008) argue, is one such critical input. From the information asymmetry perspective, the explanation would be that small firms are less known to financiers. Unlike large firms that are for instance obliged to publish financial reports, particularly if listed, small firms are not. Financial information about small firms tends to be unreliable as most are not audited, hence the reluctance of financiers to fund them. In any case, transaction costs of screening and subsequent monitoring are higher for financiers when many widely spread small businesses make up the loan portfolio than when the portfolio has a few large firms. In addition, since owners of small firms often have executive roles in their firms, the risk that the owner will misallocate externally sourced finance is high due to weak or non-existent corporate governance structures. For these reasons, small businesses are credit-rationed by financial markets and regarded as difficult to deal with by potential counterparties, as is the case with the market for used cars analogy in Akerlof (1970).

There are further explanations of why the finance constraint is more prevalent in MSMEs. Such issues can be categorised as being either macro or micro. Macro issues relate to the structure of

the economy while micro issues are specific to the firm seeking finance. Under macro issues, the level of financial markets development in a country is an important determinant of access to finance (Ayyagari *et al*., 2008; Beck, Demirgüç-Kunt and Levine, 2005; King and Levine, 1993). Firms in more developed financial markets and economies encounter fewer problems in accessing finance. Studies expounding on this hypothesis advocate for emergence of financial services providers such as microfinance institutions and venture capitalists to extend the reach of the financial markets (Banerjee and Duflo, 2010; Karlan and Morduch, 2009; Yunus, 2007).

On macro issues and associated with financial market development, Ayyagari, Demirgüç-Kunt and Maksimovic (2006) showed that countries with an independent judiciary are less susceptible to the financing problem as financiers are confident that their rights will be protected in the event of disputes or liquidation. Kumar, Rajan and Zingales (1999) showed that in such countries, small firms are more likely to grow into large firms than in countries with weak judicial systems. It is rather difficult to determine *a priori* in South Africa if the finance constraint is a serious problem for smaller firms. This stems from the fact that although the financial market is well developed, as the World Bank (2011) assessed, it is, along with other sectors of the economy, oligopolistic (Bhorat, Hirsch, Kanbur and Ncube, 2014), making it equally reasonable to suppose that MSMEs could be significantly credit-rationed.

The literature on small business finance focuses largely on micro-level explanations of the financing constraint. The literature is quite extensive, with issues of ethnic origin of owner explored if the hypothesis is that there could be ethnic-influenced credit rationing by the financial market (Blanchflower, Levine and Zimmerman, 1998: Cavalluzzo, Cavalluzzo and Wolken, 2002; Kon and Storey, 2003; Raturi and Swamy, 1999). The role of social networks in influencing access to finance is also explored on the basis that social networks could mitigate information asymmetry through the peer reference mechanism in such networks (Biggs and Shah, 2006; Lehmann and Neuberger, 2001). On both ethnic origin and social networks, it is not clear in the South African context if for instance black-owned, Asian-owned or white-owned firms would face more challenges in accessing finance, particularly given significant measures government has put in place to support black-owned enterprises potentially increasing the likelihood of crowding-out other ethnic groups.

The sector in which a firm belongs is also an important consideration as some industries may be regarded as being more likely to perform better than others (Parker, Storey and van Witteloostuijn, 2010; Storey, 1994). Gender of owner has also been investigated, with the underlying hypothesis being that female-owned firms are more exposed to the finance problem than male-owned firms (Nichter and Goldmark, 2009; Kim, 2006) and a study by Naidoo and Hilton (2006) focusing on the finance constraint and female-owned small businesses in South Africa suggested that the hypothesis holds.

The level of human capital development usually proxied by the number of years the business owner spent in school, the business owner's level of education or the years' experience a manager has is another variable explored by researchers (Brown, Earl and Lup, 2005; McPherson, 1996). The underlying hypothesis is that the higher the level of human capital investment within the firm, the less likely that the firm is affected by access to finance. In developed economies, the extent to which a firm innovates, usually proxied by expenditure on research and development or number of patents lodged for registration, has been explored as possibly explaining access to finance (Mina, Lahr and Hughes, 2013). However, it is not clear *a priori* how the innovative disposition of a firm should affect access to finance (Mina *et al*., 2013).

An important question in firm-level analyses is how to identify firms with the financing problem and the question dictates the need to measure the finance constraint. Once the financially constrained firms are identified, the characteristics discussed in the preceding paragraphs can be evaluated on how well they explain the finance constraint. Kaplan and Zingales (1997) used financial statements and annual reports information to identify a financially constrained firm but the approach is of limited use to small businesses as such information is often not available or unreliable.

Perhaps because of the lack of reliable data from MSMEs, self-reported Likert scale-based assessments of access to finance are used where ratings above a specific rating in the rating scale are defined as presence of the finance problem (Beck *et al.,* 2005). There is debate in the literature on whether perceptions on the finance constraint are a robust proxy of the actual problem encountered by firms (Canton, Grilo, Monteagudo and van der Zwan, 2013; Coluzzi *et al*., 2012; Hallward-Driemeier and Aterido, 2009; Gelb *et al*., 2007; Artola and Genre, 2011; Ferrando and Mulier, 2013; Ferrando and Griesshaber 2011). Gelb *et al.* (2007: 5) raised an interesting question to demonstrate concerns on the use of perceptions as indicators of the finance constraint, asking "but what is the benchmark against which firms in a given country are expected to rate the severity of a particular constraint?": an important question given that multinational firms are probably the only set of enterprises with some international experiences to have such a benchmark.

A review of studies in the preceding paragraph shows a mixed use of perception-based and the less subjective indicators, with the pattern growing toward the use of less subjective indicators. Canton *et al.* (2013: 702) used only the perception-based indicator as did Beck *et al.* (2005) and Beck *et al.* (2006), arguing that the indicator makes 'large-scale analysis' available to the researcher as most firms provide the rating and fewer typically provide information on the less subjective indicators such as how many of their loan applications were rejected and why.

Beck *et al*. (2013) used access to a bank account as an indicator of access to finance. When a firm does not have a bank account, such a firm, according to Beck *et al.* (2013), has a problem in accessing finance. In South Africa, the Financial Services Charter of 2004 has been instrumental in

significantly increasing the reach of banking services (Kostov, Arun and Annim, 2014; Finscope, 2010). As a result, using access to a bank account as an indicator of access to finance could understate the finance problem. This is indeed evident in Table 4.1 from the firms surveyed in 2007. Micro enterprises have the highest number of firms without a bank account: 26.7 percent of micro enterprises did not have bank accounts. This drops to 3.5 percent for small firms and the proportion is negligible for medium enterprises.

Table 4.1: Access to bank accounts

Size	**Does firm have a chequing and/or a savings account?**		
	Yes	**No**	**Total**
Micro	88 *(73.3%)*[δ]	32 *(26.7%)*	120
Small	362 *(96.5%)*	13 *(3.5%)*	375
Medium	364 *(99.5%)*	2 *(0.5%)*	366
Large	196 *(100%)*	0 *(0)*	196
Total	1 010	47	1 057

[δ] Percentage in parenthesis

Source: World Bank Enterprise Surveys (2007)

Given the summary in Table 4.1, defining access to finance based on holding a bank account seems unsuitable particularly when the objective of the analysis is to understand the small and medium firms. Alternatives to holding a bank account as a measure of access to finance could be access to specific financing products such as overdrafts, loans and lines of credit (Beck *et al.*, 2013). Of the 1 057 firms surveyed in 2007, 53 percent had overdraft facilities and 29 percent had loans or lines of credit. On a firm size basis, Table 4.2 shows that access to the two financial products improves by firm size with 13 percent of micro enterprises accessing overdrafts compared to 80 percent of large firms. Using access to overdrafts or loans and lines of credit therefore provides a fair alternative to the use of a bank account as an indicator of access to finance. Yet an indicator that captures not merely access to specific financial products but also the experiences of business owners when seeking access to financing products and the reasons why other business owners fail to access the products is perhaps a more integrated measure of the finance constraint. Importantly, such a measure implicitly analyses the lending technologies – (namely how loans are processed by financiers, Berger and Udell, 2006) - and could point out how such technologies could be improved. Kuntchev *et al*. (2013) constructed such an integrated measure of the finance constraint from the World Bank Enterprise Survey instrument.

Table 4.2: Access to overdrafts and loans by firm size

Overdraft facilities by firm size:	**Micro**	**Small**	**Medium**	**Large**	**Total**
Proportion of firms with overdraft facility	13%	43%	60%	80%	53%
Proportion of firms without overdraft facility	87%	57%	40%	20%	47%
Total number of firms	120	375	366	196	1057
Loans or lines of credit by firm size:					
Proportion of firms with loans or lines of credit	15%	18%	25%	23%	21%
Proportion of firms without loans or lines of credit	85%	82%	75%	77%	79%
Total number of firms	120	375	366	196	1057

Source: World Bank Enterprise Surveys in South Africa (2007)

4.3 FRAMEWORK FOR IDENTIFYING FINANCIALLY CONSTRAINED FIRMS

This section describes the integrated framework used by Kuntchev *et al.* (2013) to determine levels of financial constraint. The framework defines four levels of the finance constraint: Fully Credit Constrained (FCC), Maybe Credit Constrained (MCC), Partially Credit Constrained (PCC), and Non Credit Constrained (NCC). The chapter uses the framework to identify firms experiencing different levels of the finance constraint in South Africa and thereafter determines the profile of firms more likely to be financially constrained.

The framework is constructed from the finance section of the questionnaire and focuses on questions about whether or not firms applied for loans, the reasons for not applying for loans, the outcome of applications, the reasons for the outcome from the financiers' perspective and from the applicants' perspective, and how the firm financed its working capital and fixed assets requirements. A firm is assigned to one of the four categorical outcomes of FCC, PCC, MCC and NCC depending on its responses to a set of questions and statements.

Table 4.3: Framework for determining levels of finance constraint

		Fully credit constrained	**Partially constrained**	**Maybe constrained**	**Non-credit constrained**
Question/ statement to be answered by firm		Response required	Response required	Response required	Response required
	External sources of finance for working capital and fixed assets:				
1	Working capital: proportion of financing borrowed from banks (private and state owned)	0	greater than 0	greater than 0	greater than 0
2	Working capital: proportion of financing borrowed from non-bank financial institutions	0	greater than 0	greater than 0	greater than 0
3	Working capital: proportion of purchases on credit from suppliers and advances from customers	0	greater than 0	greater than 0	greater than 0
4	Working capital: proportion from other (moneylenders, friends, relatives etc.)	0	greater than 0	greater than 0	greater than 0
5	Fixed assets: proportion of financing borrowed from banks (private and state owned)	0	greater than 0	greater than 0	greater than 0
6	Fixed assets: proportion of financing borrowed from non-bank financial institutions	0	greater than 0	greater than 0	greater than 0
7	Fixed assets: proportion of purchases on credit from suppliers and advances from customers	0	greater than 0	greater than 0	greater than 0
8	Fixed assets: issued new debt (including commercial paper and debentures)	0	greater than 0	greater than 0	greater than 0
9	Fixed assets: proportion from other (moneylenders, friends, relatives etc.)	0	greater than 0	greater than 0	greater than 0
	Loans and lines of credit:				
10	Did firm apply for loans or lines of credit during the year?	Yes	No	Yes	No
11	Reasons for not applying for loan: No need for a loan Application procedures complex Interest rates unfavourable Collateral requirements unattainable Size of loan insufficient Did not think it would be approved Other	 2 3 4 5 6 7	 2 3 4 5 6 7		 1
12	How many loan applications were rejected?		greater than 0		None
13	Does firm currently have a line of credit or loan from a financial institution?	No			

Source: World Bank Enterprise Surveys Instrument (2007); Kuntchev *et al.* (2013); Author

Table 4.3 details the questions and statements along with the answers expected for a firm to be in each of the outcomes. All expected responses for each category must be met for the firm to be assigned to it. For instance, with regard to Statement 1 on working capital which seeks to establish if the firm sourced some of its working capital from private or state-owned banks, a response by the firm that '0 percent' was sourced sets the firm in the Fully Credit Constrained category subject to the following conditions. The firm must have applied for a loan or line of credit (Question 10), and if it did not apply, the reasons for not applying must be any one of those listed from 2 to 7 (Statement 11). The firm must have no outstanding debt at the time of the survey (Question 13). When all these conditions are satisfied, the firm is classified as Fully Credit Constrained. A firm is in the Non Credit Constrained category if it did not apply for a loan (Question 10) because it 'had no need for a loan' (Statement 11).

4.4 METHODS OF ANALYSIS

This chapter uses three systematic stages to explore the finance constraint in South Africa. The discussion in the preceding section relates to the last stage. In the first stage the ratings (or perceptions) of access to finance are assessed over time, and in the second stage, firms rating finance as a serious problem are contrasted to firms rating it as not. In these two first stages, the analysis uses *t*-tests to determine the significance of patterns of change and differences in performance. The remainder of this section discusses how the profile of financially constrained firms is determined after being identified using the framework in Kuntchev *et al.* (2013).

Ordered Logit Model

The aim of the analysis here is to investigate the factors that determine the different categories of the finance constraint. For this analysis, the ordered logit method is most appropriate since the four categorical outcomes (FCC, PCC, MCC and NCC) are in order of intensity of the finance constraint. Ordered logit regression estimates how well a variable (or possible explanation) correctly assigns a firm to each of the four categorical outcomes of the finance constraint. Supposing X denotes the vector of such possible explanations represented by attributes $x_1, x_2 x_3 \ldots x_n$ and Y_i^* represents the outcomes of interest from the first to the last category, the ordered logit model can be stated as follows:

$$Y_i^* = \beta_0 + x_{1i}\beta_1 + x_{2i}\beta_2 \ldots x_{ni}\beta_n + \varepsilon_i \qquad \ldots(4.1)$$

Y_i^* is in fact unobserved but what is known about Y_i^* is that each of its outcomes precludes the three other possible outcomes such that:

$$Y_i = Non\ Credit\ Constrained \quad if \quad Y_i^* \leq \mu_0$$

$$Y_i = Maybe\ Credit\ Constrained \quad if \quad \mu_0 < Y_i^* \leq \mu_1$$

$$Y_i = Partially\ Credit\ Constrained \quad if \quad \mu_1 < Y_i^* \leq \mu_2$$

$$Y_i = Fully\ Credit\ Constrained \quad if \quad Y_i^* > \mu_2 \qquad \ldots(4.2)$$

where μ_0, μ_1, and μ_2 are the cut-off points or thresholds between the four ratings to be estimated along with coefficient β for each of the attributes.

Using WBES data from 96 developing countries, Dihn *et al.* (2010) explored how well access to finance is predicted by the three categories of firm size, three categories of firm age, three categories of sectors, the extent to which a firm is an exporter, and whether a firm has foreign or government ownership, with all the variables estimated in one model. Similarly, Kuntchev *et al.* (2013) explored the association of firm size, firm age and gender to each of the four categories of the finance constraint. In addition to the variables explored by these studies, this study explores the association of ethnic origin of owner, level of education and experience of top manager with each of the four categories of the finance constraint and this can be presented in the general form as follows:

$$FC_1^4 = f(size, sector, \ldots, region) \qquad \ldots(4.3)$$

where FC_1^4 is each of the four independent outcomes (NCC, MCC, PCC and FCC). The general model specified in Equation 4.3 can be operationalised into an econometric model as follows:

$$FC_1^4 = \beta_0 + \beta_{1i} size + \beta_{2i} sectors + \cdots + \beta_{ni} region + \varepsilon \qquad \ldots(4.4)$$

where β_0 is the intercept and β_1 to β_n are the coefficients of each firm variable with i being each of the categories for variables that have more than one category. The variables investigated are firm size, sector, ethnic origin, gender, education level, experience group, age group, log of revenue per employee, exports and region.

The ordered logit model is also run on the perception-based indicator of access to finance which also has four categories (No obstacle, Minor, Moderate and Major, where major combines two categories with few observations namely ‘major’ and ‘very severe’) which enables the study to present a comprehensive perspective on the finance constraint from both a subjective and an objective indicator.

Binary Logit Model

Next, the study employs a binary logit model to explore the characteristics of firms that are financially constrained and those that are not. As will be seen in the next section, most firms are in the NCC and the PCC categories. Following Kuntchev *et al.* (2013), the analysis combines some categories to distinguish characteristics of the financially constrained and those of the not constrained. Since it is difficult to assign MCC to a credit constrained category or one that is not constrained, this analysis excludes the category in the binary comparison such that the NCC firms

are contrasted with the aggregated PCC and FCC. Effectively, the dependent variable in the above ordered logit model is altered to two outcomes: NCC and CC such that Equation 4.3 is restated as

$$FC_1^2 = f(size, sector, \dots, region) \quad \dots(4.5)$$

where FC_1^2 represents the outcome of either NCC or CC. The general model specified in Equation 4.5 can be operationalised into an econometric model as follows:

$$FC_1^2 = \beta_0 + \beta_{1i} size + \beta_{2i} sectors + \cdots + \beta_{ni} region + \varepsilon \quad \dots(4.6)$$

and as with Equation 4.4, the variables investigated are firm size, sector, ethnic origin, gender, education level, experience group, age group, log of revenue per employee, exports and region.

The analysis then interacts some of the independent variables (ethnic, gender, age group and educations) given that the enterprise development policy (White Paper, 1995) emphasises attributes implied in these variables. In the interaction terms, only the variables with all its categories enter the model along with the interaction term as illustrated in Equation 4.7 below depicting ethic origin and education levels:

$$FC_1^2 = \beta_0 + \beta ethnic\ origin + \beta education\ levels + \beta specific\ ethnic\ group\ \&\ specific\ level\ of\ education + \varepsilon \quad \dots(4.7)$$

where, for example, the specific ethnic group could be black and the specific level of education is, for instance, university graduate. All interaction terms are explored when the variables (ethnic, gender, age group, and education) enter a regression. The next section gives an overview of the data and some descriptive statistics.

4.5 DATA AND DESCRIPTIVE STATISTICS

In Chapter 2, Section 2.5 gave an overview of the WBES and reported that 803 firms were surveyed in 2003 and 1 057 in 2007. The first two stages of the analysis (tracking the importance of the finance constraint over time and whether firms reporting access to finance as a serious problem underperform) use both datasets. The 2007 surveys sampled 231 of the firms surveyed in 2003 but only 191 matched, thus there was a matched panel set of 191 firms. The third stage of the analysis, which identifies financially constrained firms and determines their characteristics as described in Section 4.3 and 4.4, uses the 2007 survey only. Table 4.4 summarises the distribution of firms into the credit constraint categories. Panel A shows the distribution into the four credit constraint categories and Panel B shows the distribution onto the two categories of the finance constraint. Most firms are not financially constrained, with only 6 percent of the sample in FCC.

Table 4.4: Distribution of firms into the credit constraint categories

	Micro	Small	Medium	Large	Total	Percentage of total	Cumulative percentage
Panel A:							
Non-credit constrained	47 *(39%)*	165 *(44%)*	198 *(54%)*	130 *(66%)*	540	51.09	51.09
Maybe credit constrained	5 *(4%)*	42 *(11%)*	67 *(18%)*	30 *(15%)*	144	13.62	64.71
Partially credit constrained	36 *(30%)*	142 *(38%)*	97 *(27%)*	34 *(18%)*	309	29.23	93.95
Fully credit constrained	32 *(27%)*	26 *(7%)*	4 *(1%)*	2 *(1%)*	64	6.05	100
Total	120	375	366	196	1057	100	
Panel B:							
Non-credit constrained	47 *(41%)*	165 *(50%)*	198 *(66%)*	130 *(78%)*	540	59.15	59.15
Credit constrained	68 *(59%)*	168 *(50%)*	104 *(34%)*	36 *(22%)*	373	40.85	100
	115	333	302	166	913	100	

Note: the percentage of firms by size in each category of the finance constraint is italics in parentheses.

Source: Author's calculations from the World Bank Enterprise Surveys South Africa (2007)

Figure 4.1 compares the results in Table 4.4 to a similar summary by Kuntchev *et al.* (2013) from a selection of geographical regions in the developing world. There are some striking differences between South Africa and the other regions. The proportion of FCC firms in South Africa is the lowest and the country has a high percentage of firms in the NCC category: 51 percent. This high proportion of NCC firms corroborates the subjective ratings of access to finance where most of the firms (63 percent) rated access to finance as not an obstacle. Kuntchev *et al.* (2013) found that 28.3 percent of small firms in sub-Saharan Africa are fully credit constrained compared to 10 percent of large firms. In South Africa, 7 percent of small firms are fully credit constrained compared to 1 percent of large firms.

Figure 4.1 shows that the extent to which firms are credit constrained in South Africa is less than would be expected from the cross-country literature on developing countries. Rather than designing policies that seek to increase the supply of finance to the generality of firms, it could be more effective to identify the types of firms that are credit-constrained and design policies that could mitigate the obstacles such firms encounter when seeking finance.

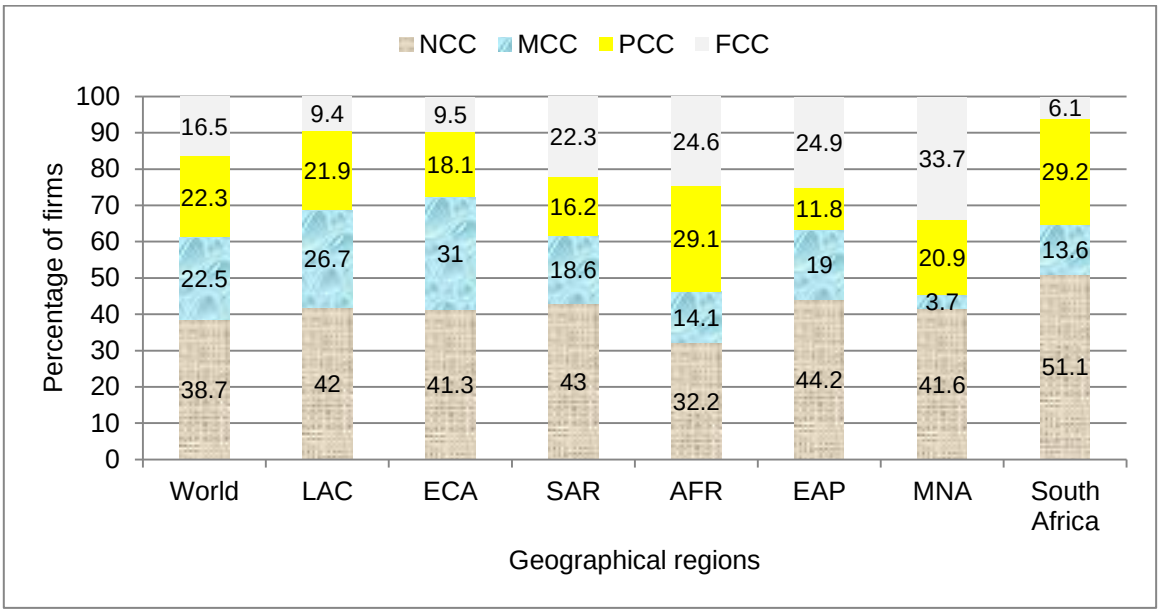

Figure 4.1: A comparison of credit constraint status of South Africa and other regions

Notes: On the Y-axis, FCC stands for Fully Credit Constrained, PCC for Partially Credit Constrained, MCC for Maybe Credit Constrained and NCC for Non Credit Constrained. On the X-axis, LAC stands for Latin America and Caribbean, ECA for Eastern Europe and Central Asia, SAR for South Asia, AFR for sub-Saharan Africa, EAP for East Asia and Pacific, MNA for Middle East and North Africa.

Source: Kuntchev *et al*. (2013); Author's estimations on World Bank Enterprise Surveys South Africa (2007)

4.6 RESULTS

Three subsections in this section present results. The first shows how the finance constraint has been considered by business owners and managers over time, the second shows whether firms reporting finance as a constraint show weaker performance, and the third shows the profile of firms that experience obstacles when seeking external finance.

4.6.1 Importance of finance: a review of perceptions between 2003 and 2007

The matched set of 191 enterprises surveyed in 2003 and 2007 makes it possible to track the importance of the finance constraint to the same firm over time. On comparing how the same firm rated access to finance in 2003 to how it rated the obstacle in 2007, a decline in the importance of the finance constraint is observed. Figure 4.2 shows the shift towards 'none' (which denotes 'no obstacle') for the matched panel set of 191 firms. An important question arising from Figure 4.2 is whether the shift is a significant improvement in the perception of finance accessibility. Comparing the mean ratings in the radar chart confirms that the improvement is significant, with the null hypothesis of equal mean ratings in the two periods not being accepted as shown by the mean-

comparison tests in Table 4.5. It can be seen in Table 4.5 that the mean rating is 1.23 in 2003 against 0.45 in 2007.

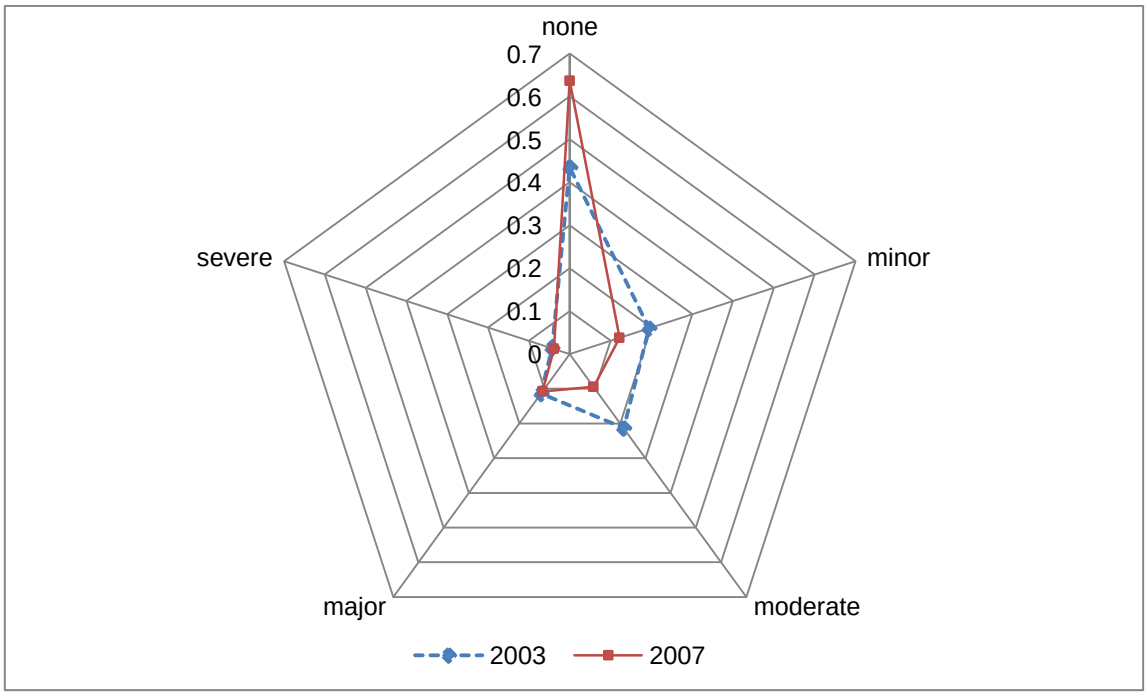

Figure 4.2: Access to finance 2003 vs. 2007

Source: Enterprise Surveys of South Africa (2003; 2007)

Table 4.5: Mean-comparison test (paired) for access to finance, 2003 vs. 2007

Variable	Obs.	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Access to finance 2003	191	1.2251	0.0955	1.3205	1.0367	1.4136
Access to finance 2007	191	0.4450	0.0650	0.8979	0.3169	0.5732
diff	191	0.7801	0.1151	1.5907	0.5531	1.0071
mean(diff) = mean (Access to finance 2003 – Access to finance 2007)						t = 6.7777
Ho: mean (diff) = 0						degrees of freedom = 190
Ha: mean (diff) < 0			Ha: mean(diff) ≠ 0			Ha: mean(diff) > 0
Pr(T < t) = 1.0000			Pr(|T| > |t|) = 0.0000			Pr(T > t) = 0.0000

Source: Author's estimations based on Enterprise Surveys of South Africa (2003; 2007)

The 191 firms of course remained in business between 2003 and 2007. But many studies have shown a high failure rate of small businesses, as is indeed indicated by the high job losses attributable to SMEs in a study by Kerr *et al*. (2014) in South Africa. This suggests that the panel set comparison could be inherently biased in favour of resilient firms that may have survived in the presence of constraints such as challenges in accessing finance. To offset the bias, a comparison is made in Table 4.6 of the mean rating of access to finance of firms surveyed in '2003 only' to those surveyed in '2007 only': 412 firms in 2003 and 866 firms in 2007.

Table 4.6: The importance of access to finance (2003 vs. 2007)

	Observations	Mean	Standard error	Standard deviation	[95% Confidence Interval]	
Access to finance 2003	412	1.1384	0.0600	1.2174	1.0205	1.2562
Access to finance 2007	866	0.8661	0.0428	1.2587	0.7821	0.9500
combined	1278	0.9538	0.0350	1.2516	0.8852	1.0225
diff		0.2723	0.0737		0.1277	0.4169
diff = mean(2003) - mean(2007)					t = 3.6964	
Ho: diff = 0			Satterthwaite's degrees of freedom = 832.999			
Ha: diff < 0			Ha: diff ≠ 0		Ha: diff > 0	
Pr(T < t) = 0.9999			Pr(|T| > |t|) = 0.0002		Pr(T > t) = 0.0001	

Source: Author's estimations based on Enterprise Surveys of South Africa (2003; 2007)

Table 4.6 shows that 2007 ratings are better as the 95 percent confidence interval is well within the 2003 range. The difference is statistically significant at 1 percent, confirming that there was an improvement in the perceptions of access to finance in the period between 2003 and 2007. The mean-comparison test therefore affirms a marked improvement in access to finance in South Africa in the period 2003 to 2007 as captured in Figure 4.2. This suggests that the BBBEE policy measures have perhaps been effective in addressing the finance constraint except with regard to white-owned firms, as Chapter 3 revealed.

4.6.2 Do firms reporting finance to be a serious obstacle underperform?

It would be expected that firms reporting access to finance as a problem would experience slower growth than those reporting it as not. However, this hypothesis has been largely unexplored by empirical investigations and this sub-section contributes to filling this gap in the empirical literature. Defining growth first in terms of percentage change in the number of jobs created between 2003 and 2007 and then as the percentage change in sales between 2003 and 2007, a comparison of whether firms rating access to finance as a major problem had growth rates significantly lower than firms rating access to finance as not a problem was done. The comparison is on both employment and sales growth, with two sample *t*-tests conducted to determine if the difference is significant. Table 4.7 presents the results of the comparison, with Panel A reporting on employment growth and Panel B on sales growth. There is no evidence that firms reporting access to finance as an obstacle grow at a rate significantly different to those that rate access to finance as not an obstacle. In fact, the mean growth rates for the 'no obstacle' firms in both Panel A and B are less than the firms reporting access to finance as an obstacle. It must be noted however that the standard deviations of the growth rates of firms reporting finance as an obstacle is higher in both Panels suggesting that such returns are unstable. It is therefore not surprising that such high-risk firms would face problems in accessing finance.

Table 4.7: Performance of firms reporting finance as obstacle vs. those not

Panel A: Employment growth (two-sample t test with unequal variances)

Category	Observations	Mean	Standard error	Standard deviation	[95% Confidence Interval]	
No obstacle	443	0.0763	0.0046	0.0971	0.0672	0.0853
Obstacle	247	0.0876	0.0072	0.1156	0.0731	0.1021
Combined	690	0.0803	0.0040	0.1042	0.0725	0.0881
diff		-0.0114	0.0087		-0.0284	0.0057
mean(diff) = mean (no obstacle - obstacle)						t = -1.3102
Ho: mean (diff) = 0					Satterthwaite's degrees of freedom	= 439.987
Ha: mean (diff) < 0			Ha: mean(diff) ≠ 0			Ha: mean(diff) > 0
Pr(T < t) = 0.0954			Pr(|T| > |t|) = 0.1908			Pr(T > t) = 0.9046

Panel B: Sales growth (two-sample t test with unequal variances)

Category	Observations	Mean	Standard error	Standard deviation	[95% Confidence Interval]	
No obstacle	410	0.1127	0.0063	0.1275	0.1003	0.1251
Obstacle	211	0.1350	0.0110	0.1602	0.1133	0.1568
Combined	621	0.1203	0.0056	0.1398	0.1093	0.1313
diff		-0.0223	0.0127		-0.0473	0.0027
mean(diff) = mean (no obstacle - obstacle)						t = -1.7581
Ho: mean (diff) = 0					Satterthwaite's degrees of freedom	= 350.118
Ha: mean (diff) < 0			Ha: mean(diff) ≠ 0			Ha: mean(diff) > 0
Pr(T < t) = 0.0398			Pr(|T| > |t|) = 0.0796			Pr(T > t) = 0.9602

Source: Author's estimations based on Enterprise Surveys of South Africa (2007)

There are two important inferential conclusions from this and the preceding subsection reviewing access to finance from 2003 to 2007. The first is that the perception of access and cost of finance improved between 2003 and 2007, and the second is that even though some firms reported access to finance to be a problem in 2007, there is insufficient evidence to conclude that their performance was affected by the problem as proxied by the rating assigned in the Likert scale.

It would be informative to determine whether access to finance improved further using the WBFCS 2010 data. The limitation with the WBFCS, however, is that it has a smaller sample of 234 firms compared to 1 057 firms by WBES of 2007. Of the 234 firms, 122 are small and 72 medium. Microenterprises were not covered by the WBFCS. Although the WBFCS are less representative of the MSMEs, a comparison of how the firms surveyed in 2010 rated the finance constraint is useful to enhance the understanding of the finance constraint in South Africa even with the limitations of the data.

As was done in Table 4.6 in comparing the 2003 and 2007 mean ratings, Table 4.8 presents the *t*-test results determining whether the ratings of access to finance in 2007 improved further in 2010. Table 4.8 shows that there was a significant deterioration in the ratings of access to finance, with

the mean rating of 0.866 in 2007 declining to 1.701 in 2010. This result would indeed be expected given the financial strain that firms and financiers were facing during the global financial crisis.

Table 4.8: The importance of access to finance (2007 vs. 2010)

	Observations	Mean	Standard error	Standard deviation	[95% Confidence Interval]	
Access to finance 2007	866	0.8661	0.0428	1.2587	0.7821	0.9500
Access to finance 2010	221	1.7014	0.0939	1.3953	1.5164	1.8863
combined	1087	1.0359	0.0403	1.3302	0.9567	1.1150
diff		-0.8353	0.1031		-1.0382	-0.6324
diff = mean(2007) - mean(2010)					t =	-8.0986
Ho: diff = 0			Satterthwaite's degrees of freedom =			317.39
Ha: diff < 0			Ha: diff ≠ 0			Ha: diff > 0
Pr(T < t) = 0.0000			Pr(|T| > |t|) = 0.0000			Pr(T > t) = 1.0000

Source: Author's estimations based on World Bank Enterprise Surveys of South Africa (2007) and World Bank Financial Crisis Survey (2010)

Although studies on the impact of the global financial crisis on MSMEs in developing economies are limited, studies in more developed economies, especially in Europe (Ferrando and Griesshaber, 2011; Popov and Udell, 2012; Campello, Graham and Harvey, 2010), show increased effects of the finance constraint in the years 2008, 2009 and 2010 on banks and firms. The studies show that the effects were greater on the small and medium enterprises. A survey of 1 050 firms in Asia, Europe and the USA by Campello *et al*. (2010) for instance finds that 82 percent of small firms (compared to 18 percent of large firms) reported being 'very affected' by the financial crisis-induced difficulties in accessing finance.

It therefore does not suffice to confirm only that accessing finance was difficult for firms in South Africa in 2010, as the observation would likely be the same for firms in globally integrated economies. Thus, a comparison of South African firms' ratings of the finance constraints to the ratings by firms in peer economies surveyed at about the same time is useful to explore how better or worse off firms in South Africa were in accessing finance during the crisis years. Unfortunately, most of the peer nations used in Chapter 2, namely the BRICS plus Nigeria and Ghana, were not surveyed in the period of interest. Therefore, the current analysis defines peer nations as upper middle-income countries surveyed by the WBES in the years 2009, 2010 and 2011. Since some of the peers have small populations (e.g. Saint Lucia has a population of 174 000), an arbitrary minimum population of 5 million was used to make the sample comparable to South Africa. The result is 11 peer economies.

The WBES reports the proportion of firms per country that rated access to finance as a major problem[6]. Figure 4.3 compares the rating of access to finance in 2010 by firms in South Africa to ratings by firms in the 11 peer economies. Figure 4.3 shows that 18.8 percent of firms in South Africa rated finance as a major problem compared to 45 percent of firms in Brazil. Compared to the peer economies, finance in 2010 was a relatively less serious problem in South Africa.

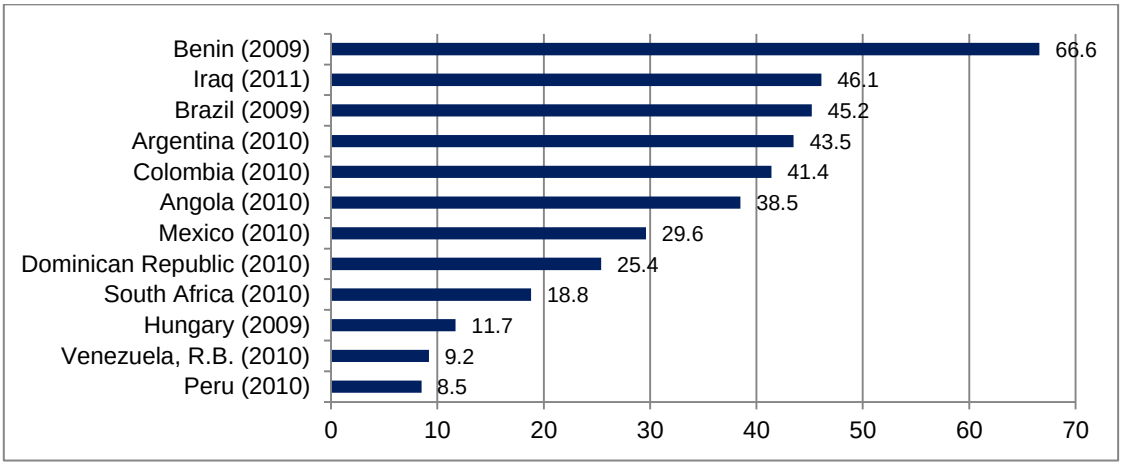

Figure 4.3: Percentage of firms identifying access to finance as a major constraint

Source: World Bank Enterprise Surveys; World Bank Financial Crisis Survey South Africa (2010)

Although access to finance is often found to be a top constraint and a binding constraint for MSMEs elsewhere, the sample of MSMEs used in this research shows that the firms have other more pressing problems. The inference from this review of the finance constraint in South Africa is that availability of finance has been improving (except for an expected deterioration during the global financial crisis). Yet to draw such inferences is not to say that there are no firms encountering serious problems in trying to access finance. It is thus necessary to determine if there could be such firms in South Africa using the framework in Section 4.3 and investigate their profile.

4.6.4 The profile of financially constrained firms: ordered logit results

Section 4.4 presented the ordered logit model the chapter uses to explore characteristics that could be peculiar to each of the four categories of the finance constraint. This subsection discusses the results of the ordered logit model presented in Table 4.9. In Table 4.9, Column 1 reports the results when the perceptions-based measure of the finance constraint (in which outcomes are None, Minor, Moderate or Major) is used, and Column 2 reports results when the more objective measure based on the framework by Kuntchev *et al.* (2013) (in which outcomes are

[6] The reports for each country are available on www.enterprisesurveys.org.

NCC, MCC, PCC and FCC) is used. In discussing the results, 'perceptions-based' will be used to refer to Column 1 and 'objective' will be used to refer to the results in Column 2.

Table 4.9: Ordered logit results on finance constraint

Variable		Column 1 dependent is perception-based	Column 2 dependent is based on actual experiences
Size:	Micro	2.312 *(0.014)*	4.543 *(0.000)*
	Small	2.076 *(0.004)*	2.218 *(0.000)*
	Medium	1.789 *(0.010)*	1.430 *(0.069)*
	Large	(base)	(base)
Sector:	Retail	(base)	(base)
	Services	1.106 *(0.646)*	1.362 *(0.145)*
	Manufacturing	1.789 *(0.003)*	2.233 *(0.000)*
Ethnic origin:	Black	2.818 *(0.000)*	3.399 *(0.000)*
	Asian	1.863 *(0.000)*	2.254 *(0.000)*
	White	(base)	(base)
Gender:	Male	(base)	(base)
	Female	1.141 *(0.391)*	0.819 *(0.179)*
Education level of manager:	Up to secondary school	0.927 *(0.687)*	1.319 *(0.115)*
	Vocational training	0.977 *(0.889)*	1.152 *(0.365)*
	University graduate	(base)	(base)
Experience group:	Less than 5 years	0.656 *(0.035)*	0.891 *(0.534)*
	6 to 10 years	0.836 *(0.289)*	0.940 *(0.696)*
	More than 10 years	(base)	(base)
Age group of firm*:	Young	1.637 *(0.027)*	1.198 *(0.379)*
	Mature	1.103 *(0.856)*	0.970 *(0.858)*
	Old	(base)	(base)
Exports percentage in sales:		0.487 *(0.001)*	0.939 *(0.729)*
Region:	Johannesburg	(base)	(base)
	Durban and Port Elizabeth	0.674 *(0.059)*	0.633 *(0.015)*
	Cape Town	0.343 *(0.000)*	0.785 *(0.163)*
/cut1		1.646	1.697
/cut2		2.323	2.361
/cut3		3.020	4.740
R-squared		0.076	0.077
Number of firms		1037	1037

Note: Column 1 dependent variable is how business owners or managers rated access to finance as affecting their operations on a scale of 0 to 4 where 0 is 'No obstacle', 1 is 'Minor', 2 is Moderate and 3 is 'Major' and 'Very severe'. Column 2 dependent variable is how firm responded to a number of questions as detailed in Table 4.3 and such responses determined classification of a firm into one of four categories, namely NCC, MCC, PCC and FCC.
*On Firm age, Young firms are up to 5 years, Mature is between 6 and 15 years, and Old is above 15 years.

Source: Author's estimations based on the World Bank Enterprise Surveys in South Africa (2007)

The first block of rows in Table 4.9 reports on firm size, with large firms being the reference category. On the perceptions-based analysis, micro, small and medium-sized firms are more likely to assign a rating towards 'major' for access to finance than large firms. There are similar results when the objective measure is used. In relation to large firms, for instance, the odds are 2.4 times that a micro enterprise will regard finance as a serious obstacle and, when the actual experiences of micro and large enterprises in seeking finance are considered, the odds increase to 5 times.

For small firms employing between 5 and 20 employees with large firms being the reference category, the odds are the same on both measures, being 2.2 times. For medium firms, however, while the odds are 1.9 times (and significant) that the firm will regard finance as a serious obstacle, the study found insufficient evidence to show that medium-sized firms will be classified more towards the FCC category, which suggests that medium-sized firms are less likely to be credit constrained than large firms. Thus with regard to firm size, the likelihood that micro and small firms are credit constrained is significant but this is not the case for medium-sized firms. It will be seen in the binary logit results that when the MCC firms are excluded from the analysis that the odds of micro and small firms being credit constrained increase.

In both the perceptions-based and objective measure of the finance constraint, when the retail sector is the reference category, the manufacturing sector is more likely to face challenges in accessing finance, and the likelihood increases on the objective measure, suggesting the importance of the problem to the sector. Results on ethnic origin are also significant on both indicators and show that in relation to white-owned firms, firms owned by previously disadvantaged groups (blacks and Asians) are more likely to regard access to finance as a serious problem and more likely to be in the financially constrained categories of PCC and FCC. With white-owned firms as the reference category, the odds are 3.4 times and 2.2 times that a black-owned firm and an Asian-owned firm respectively will encounter challenges in seeking finance.

There is insufficient evidence from the ordered logit analysis, the subsequent binary logit model, and the models with interactions to associate gender with the finance constraint. There is also insufficient evidence in Table 4.9 to associate exports with the finance constraint in the sample of firms studied. The ordered logit analysis does not find sufficient evidence to associate the three categories of manager's experience with actual levels of the finance constraint. However, on the perceptions-based measure, firms run by managers with less than 5 years' experience are less likely to regard access to finance as being a major obstacle. Compared with old firms, the odds are 1.8 times that young firms will regard finance to be a serious obstacle but the effects are insignificant when an objective measure is used.

While results show that the odds are higher that the less formally educated managers are likely to be in the worst categories of the finance constraint (e.g. when university graduates are the base category, the odds are 1.3 and 1.5 times that managers with up to secondary school education and managers with vocational training will be towards the worst categories of the finance constraint), these results are not significant. In relation to Johannesburg-based firms, firms in other cities are less likely to regard finance as a major obstacle and are less likely to be financially constrained. It could be that the costs of doing business in Johannesburg, such as rent, labour etc. are higher, thus increasing the need for external finance by firms. Furthermore, Chapter 3 showed that firms in

Johannesburg are significantly affected by electricity, a problem that would increase costs through, for example, use of generators, and make it more challenging for such firms to access finance.

The predicted probabilities for the two ordered logit models are reported in Table 4.10.

Table 4.10: Predicted probabilities from ordered logit models

		Perception-based				Actual experiences			
		None	Minor	Moderate	Major	NCC	MCC	PCC	FCC
Size:	Micro	0.5852	0.1504	0.1123	0.1521	0.2855	0.1517	0.4562	0.1066
	Small	0.6111	0.1449	0.1053	0.1387	0.4500	0.1640	0.3309	0.0551
	Medium	0.6458	0.1366	0.0957	0.1219	0.5594	0.1523	0.2521	0.0362
	Large	0.7653	0.1001	0.0626	0.0720	0.6448	0.1344	0.1952	0.0256
Sector:	Retail	0.7269	0.1131	0.0732	0.0868	0.6324	0.1374	0.2032	0.0270
	Services	0.7063	0.1195	0.0789	0.0952	0.5580	0.1525	0.2531	0.0364
	Manufacturing	0.5992	0.1475	0.1085	0.1448	0.4352	0.1645	0.3421	0.0583
Ethnic origin:	Black	0.5269	0.1602	0.1277	0.1851	0.3602	0.1623	0.3994	0.0781
	Asian	0.6276	0.1411	0.1008	0.1306	0.4592	0.1635	0.3241	0.0532
	White	0.7584	0.1025	0.0645	0.0746	0.6567	0.1314	0.1876	0.0243
Gender:	Female	0.6591	0.1331	0.0921	0.1157	0.4937	0.1609	0.2987	0.0466
	Male	0.6289	0.1408	0.1004	0.1299	0.5435	0.1548	0.2632	0.0385
Education:	Up to secondary	0.6628	0.1321	0.0910	0.1141	0.4680	0.1630	0.3176	0.0514
	Vocational	0.6508	0.1353	0.0944	0.1196	0.5020	0.1601	0.2927	0.0452
	University	0.6455	0.1366	0.0958	0.1220	0.5372	0.1557	0.2676	0.0395
Experience group:	Up to 5 years	0.7099	0.1184	0.0779	0.0937	0.5225	0.1577	0.2780	0.0418
	6 to 10 years	0.6576	0.1335	0.0925	0.1164	0.5091	0.1593	0.2876	0.0440
	Above 10 years	0.6163	0.1437	0.1039	0.1361	0.4935	0.1610	0.2988	0.0466
Firm age group:*	Young	0.5741	0.1525	0.1153	0.1581	0.4711	0.1628	0.3153	0.0508
	Mature	0.6808	0.1271	0.0860	0.1061	0.5239	0.1575	0.2770	0.0415
	Old	0.6882	0.1250	0.0840	0.1029	0.5163	0.1585	0.2824	0.0428
Region:	Johannesburg	0.5929	0.1488	0.1102	0.1480	0.4779	0.1623	0.3102	0.0495
	Cape Town	0.6836	0.1263	0.0853	0.1049	0.5912	0.1464	0.2305	0.0319
	Durban-PE	0.8092	0.0840	0.0505	0.0563	0.5383	0.1556	0.2669	0.0393

Note: The perception-based indicator of the finance constraint is based on how business owners or managers rated access to finance as affecting their operations on a scale of 0 to 4, where 0 is 'No obstacle', 1 is 'Minor', 2 is Moderate and 3 is 'Major' and 'Very severe'. The actual experiences measure of the finance constraint is determined by how firms responded to a number of questions as detailed in Table 4.3 and such responses determine the classification of a firm into one of four categories: namely Not Credit Constrained, Maybe Credit Constrained, Partially Credit Constrained and Fully Credit Constrained.
*On Firm age, Young firms are up to 5 years, Mature is between 6 and 15 years, and Old is above 15 years.

Source: Author's estimations from the World Bank Enterprise Surveys in South Africa (2007)

The predictions assume that all other variables in the model other than the variable being predicted are held at their means. Thus, with reference to the results based on the actual experiences and in relation to micro enterprises, the predicted probability of being in the NCC category is 28.55

percent. Micro enterprises have the highest predicted probability of being partially credit constrained and being fully credit constrained followed by black-owned firms, the manufacturing sector and small firms for the same categories of the finance constraint. On the other hand, the predicted probability of white-owned firms being in the NCC category is 65.67 percent and the highest for that category, followed by the retail sector and medium enterprises.

4.6.4 The profile of financially constrained firms: binary logit results

The results of the goodness-of-fit test of the logit model are summarised in Table 4.11. In essence, the ordered logit model discussed in the preceding subsection folds into the binary logit model reported in this subsection. Table 4.1 shows that the binary logit model correctly classifies 70 percent of the 893 firms analysed. Specifically, the model correctly classifies 78 percent of NCC firms and 58 percent of the Credit Constrained (CC) firms are correctly classified.

Table 4.11: Goodness-of-fit test for logit model

	--------TRUE--------		
Classified	D	~D	Total
+	208	116	324
-	152	417	569
Total	360	533	893
Classified + if predicted Pr(D) >= .5 True D defined as finance constraint ≠0			
Sensitivity measure	Pr(+ D)	57.78%	
Specificity measure	Pr(- ~ D)	78.24%	
Positive predictive value	Pr(D +)	64.20%	
Negative predictive value	Pr(~ D -)	73.29%	
False + rate for true ~D	Pr(+ ~D)	21.76%	
False - rate for true D	Pr(- D)	42.22%	
False + rate for classified +	Pr(~ D +)	35.80%	
False - rate for classified -	Pr(D -)	26.71%	
Correctly classified			69.99%

Note: The sensitivity measure (208/360) reports the proportion of firms in the Credit Constrained category that are correctly classified by the model. The specificity measure (417/533) reports the proportion of firms in the Non Credit Constrained category that are correctly classified by the model. The false positive and false negative classification error rates are 116/533 and 152/360 respectively.

Source: Author's estimations based on World Bank Enterprise Surveys (2007)

Table 4.12 reports the logit regression results where FCC and PCC are combined to form CC and compared to NCC. As would perhaps be expected from the ordered logit results, micro and small enterprises are more likely to be credit constrained than large firms. The odds that the manufacturing sector firms are credit constrained increase from 1.8 times in the ordered logit estimations to 2.3 times in the binary logit analysis. The odds are also higher that the firms owned by the previously disadvantaged groups will be credit constrained, being 4 times and 2.7 times for

black- and Asian-owned firms respectively compared to white-owned firms. Firms in Cape Town are less likely to be credit constrained than firms in other cities.

Table 4.12: Logit regression results: Not Credit Constrained and Credit Constrained

		Coefficient	Odds ratio	P-value	95% Confidence Interval (Odds ratio)	
Size	Micro	1.076	2.932	0.005	1.379	6.238
	Small	0.920	2.509	0.001	1.441	4.369
	Medium	0.344	1.411	0.188	0.846	2.354
	Large	(base)	(base)			
Sector	Retail	base	base			
	Services	0.333	1.396	0.179	0.858	2.270
	Manufacturing	0.845	2.328	0.000	1.506	3.599
Ethnic	Black	1.406	4.081	0.000	2.771	6.010
	Asian	0.980	2.665	0.000	1.808	3.926
	White	(base)	(base)			
Gender	Female	-0.237	0.789	0.201	0.549	1.135
Education	Up to secondary school	0.304	1.356	0.156	0.890	2.065
	Vocational	0.312	1.366	0.107	0.934	1.997
	University	(base)	(base)			
Experience	Up to 5 years	-0.126	0.882	0.576	0.567	1.370
	6 to 10 years	-0.092	0.912	0.640	0.620	1.342
	Above 10 years	(base)	(base)			
Firm age	Young	0.303	1.354	0.237	0.820	2.237
	Mature	-0.037	0.964	0.866	0.626	1.482
	Old	(base)	(base)			
Exports percentage in sales		-0.048	0.953	0.842	0.593	1.531
Region	Johannesburg	(base)	(base)			
	Cape Town	-0.897	0.408	0.001	0.239	0.696
	Durban-Port Elizabeth	-0.276	0.759	0.180	0.507	1.136
_constant		-2.321				
R-squared		14.42				
Number of observations		893				

Source: Author's estimations based on the World Bank Enterprise Surveys (2007)

Table 4.13 presents the interaction results where only the interacting variables enter the binary logit regression. Interacting age group and education levels of managers shows that for young firms, the financial constraint is more likely to be experienced when the firm is run by managers with vocational level education but that the prevalence of the constraint is perhaps more likely to diminish with university level education. This affirms some of the existing evidence in South Africa that higher levels of education and training improves enterprise performance (Unger, Keith, Hilling, Gielnik and Frese, 2009; Lotz and Marais, 2007; Visser *et al*., 2005). However, young firms run by managers with up to secondary school education are significantly less likely to be credit

constrained. On the other hand, mature and old firms run by managers with up to secondary school education are more likely to be constrained. Thus over time, or as the firm ages, higher levels of education mitigate the finance constraint, further affirming the importance of training as an essential intervention for small businesses in South Africa.

Table 4.13: Effects of interaction terms in logit regression on finance constraint

Interaction		Odds Ratio	P-value	[95% Confidence Interval]	
Age group and education	Young & Secondary school	0.421	0.006	0.227	0.780
	Young & Vocational	1.978	0.025	1.091	3.583
	Young & University	1.230	0.549	0.625	2.420
	Mature & Secondary school	1.404	0.280	0.759	2.598
	Mature & Vocational	0.805	0.472	0.447	1.452
	Mature & University	0.890	0.728	0.463	1.713
	Old & Secondary	1.842	0.073	0.945	3.591
	Old & Vocational	0.636	0.163	0.337	1.201
	Old & University	0.900	0.741	0.482	1.680
Age group and ethnic origin	Young & Black	0.864	0.644	0.464	1.608
	Young & Asian	1.555	0.209	0.781	3.095
	Young & White	0.771	0.487	0.371	1.604
	Mature & Black	1.596	0.149	0.846	3.010
	Mature & Asian	1.235	0.537	0.631	2.419
	Mature & White	0.504	0.042	0.261	0.977
	Old & Black	0.684	0.282	0.342	1.367
	Old & Asian	0.546	0.073	0.283	1.057
	Old & White	2.558	0.004	1.338	4.890
Ethnic origin and education	Black & Secondary School	1.157	0.651	0.615	2.174
	Black & Vocational	1.314	0.364	0.729	2.369
	Black & University	0.540	0.074	0.275	1.061
	Asian & Secondary school	1.208	0.603	0.593	2.459
	Asian & Vocational	1.675	0.115	0.882	3.181
	Asian & University	0.487	0.036	0.249	0.953
	White & Secondary school	0.699	0.319	0.346	1.414
	White & Vocational	0.418	0.008	0.219	0.800
	White & University	3.604	0.000	1.892	6.863
Ethnic origin and gender	Black & Female	0.788	0.493	0.400	1.555
	Black & Male	1.275	0.483	0.646	2.517
	Asian & Female	0.912	0.811	0.429	1.939
	Asian & Male	1.097	0.811	0.516	2.332
	White & Female	1.579	0.264	0.708	3.521
	White & Male	0.796	0.580	0.355	1.783

Note: On Age group, Young is less up to 5 years old, Mature is 6 to 15 years old and Old is above 15 years.

Source: Author's estimations from the World Bank Enterprise Surveys (2007)

With regard to ethnic origin and education there seems to be a pattern, albeit not significant, that higher levels of education for black-owned firms reduces the likelihood of a firm being in the credit constrained category. For the other ethnic groups, the results are mixed. For instance university educated managers in Asian-owned firms are significantly associated with the NCC category, while university educated managers in white-owned firms are more likely (and significantly so) to be in the CC category. The finding that white-owned firms with university-educated managers are more likely to be financially constrained perhaps needs to be investigated further by researchers because high levels of human capital in the firm should improve its access to finance. However, it seems reasonable to suppose that in the BBBEE policy environment, white-owned firms are at a disadvantage because they cannot access BBBEE-related support.

4.7 IMPLICATIONS FOR POLICY AND RESEARCH

The finance constraint is prominent in the small enterprise development literature and practice. Evidence from this chapter suggests that the seriousness of access to finance on MSMEs in South Africa could perhaps be less prevalent. While results broadly affirm that smaller firms are most vulnerable to the problem, it emerged from this chapter that black-owned and Asian-owned firms experience challenges in accessing finance. Given the policy emphasis of supporting these previously disadvantaged groups, especially through the BBBEE legislation, a result showing that black- and Asian-owned firms are more affected would seem less likely. It perhaps suggests the enormity of the finance constraint that the previously disadvantaged groups could be facing.

It is probably necessary to reflect more on the ethnic results with consideration of the results on how levels of education associate with the finance constraint. While the association between education and the finance constraint is not significant in the sample of firms studied, there was a minor relationship between education and the finance constraint at higher levels of education in black-owned firms. Table 4.14 shows that in the sample used, the number of blacks with a university education was the lowest, accounting for 21 percent of the 359 black business owners in the sample, while 42 percent of whites and Asians were university graduates, which is double the proportion of the black sub-sample.

Table 4.14: Education and ethnic origin

Level of education	African	Asian	European	Total
Up to secondary school	38%	21%	23%	296
Vocationally trained	40%	37%	34%	391
University graduate	21%	42%	42%	370
Total number of managers	359	284	414	1,057

Source: World Bank Enterprise Surveys in South Africa (2007)

In the sample used in this chapter, 38 percent of the blacks had up to secondary education against 21 percent and 23 percent for Asians and whites respectively. If the goals of BBBEE and enterprise development are to be realised, it is imperative that policy motivates educated blacks to set up their own businesses as they are less likely to encounter as many obstacles as the less educated business owners. The interacting term of levels of education and black-owned firms showing a pattern of a declining likelihood of being financially constrained at higher levels of education affirms the importance of encouraging blacks with higher levels of formal education to become entrepreneurs. It is important however to recognise the potentially high opportunity costs for educated blacks to start businesses given the employment opportunities available to them, especially through the affirmative action provisions of the Employment Equity Amendment Act of 2013 which applies to employers with 50 or more workers or firms with turnovers above thresholds set by Schedule 4 of the Act. The provisions of the Act require that 'designated groups' (i.e. black people, women and people with disabilities) "have equal employment opportunities and are equitably represented in all occupational levels of the workforce" (Employment Equity Amendment Act, 2013: 24).

In Chapter 3, the interaction term of small and white-owned firms and small firms in Cape Town were significantly affected by access to finance. The analysis in Chapter 3 is based on perceptions of access to finance. Exploring the interaction effects using the objective indicator of access to finance, white-owned small firms are significantly less likely to be credit constrained. Similarly, while the odds ratio that small firms in Cape Town will be constrained is 1.5 times that of small firms in Johannesburg, Durban and Port Elizabeth, the ratio is not significant. Thus firms found to be credit constrained in the interactions of Chapter 3, when the perception-based measure of access to finance was used, are, from the evidence in this chapter, where an objective measure is used, not likely to be credit constrained. However, old white-owned firms and white-owned firms run by university-educated managers are more likely to be credit constrained, indicating that the

explanation suggested in Chapter 3 that white-owned firms could be more vulnerable to the finance problems of the adverse effect of BBBEE support could be plausible.

Firms in the manufacturing sector are more likely to be financially constrained. This is important for policy formulation. It motivates financing interventions that suit the manufacturing sector better than other sectors that are less impacted. Such financial interventions could include lease financing manufacturing technologies and working capital facilities such as invoice discounting. It is however necessary that further research be done to determine financing products suitable for the SMEs and microenterprises in the manufacturing sector which, unlike the services sector, have other costs (e.g. production costs) which are difficult to be financed by credit terms from suppliers.

4.8 CONCLUSION

This chapter investigated the importance of the finance constraint in South Africa. It showed that the seriousness of the problem as proxied by feedback from firms has declined over time. The chapter showed that the performance of firms that rated access to finance as serious did not underperform those that rated access to finance as not a problem. The chapter then identified firms that actually experience challenges in accessing finance to determine their characteristics. Black- and Asian-owned firms, young firms, and firms in the manufacturing sector are more likely to be financially constrained. It is such firms that policy can target with financial support.

CHAPTER 5: WHAT CHARACTERISES HIGH-GROWTH FIRMS IN SOUTH AFRICA?

5.1 INTRODUCTION

Empirical studies provide mixed evidence that small businesses reduce unemployment (Biggs, 2000). Considerable resources are nonetheless spent promoting small and emergent firms (Beck *et al*., 2005; Hallberg, 2000). A perspective that perhaps needs consideration in the small-firms job-creation discussions, especially in developing countries, is the growing body of evidence showing that a small segment of enterprises in an economy accounts for 50 to 70 percent of net new jobs (Henrekson and Johansson, 2010; Audretsch, 2012; Nightingale and Coad, 2013). This chapter uses the WBES and employs logit and quantile regression to determine the characteristics of what could be such high-growth firms in South Africa.

In the three decades since Birch (1981) showed small businesses contributing more to employment than larger firms, many studies as reviewed by Storey (1994) and van Praag and Versloot (2007) have affirmed the role of small businesses in job creation. Globally, the studies have bolstered public policy support for MSMEs. Davis *et al.* (1994) however revealed that although smaller firms create jobs they often fail to retain the new employees as most of the firms fold. In South Africa, for instance, Kerr *et al*. (2014) found that between 2005 and 2011, firms with up to 20 employees created 75 000 jobs quarterly but lost 110 000. Most of the unemployed engage in informal survivalist activities, hopeful for formal jobs. Whether MSMEs reduce unemployment is therefore a highly contested assertion (Mason and Brown, 2013; Shane, 2009; Beck, Demirgüç-Kunt and Levine, 2005).

What perhaps offers an interesting perspective to discussions on enterprise development and job creation is the growing body of evidence showing that a small segment of firms in an economy accounts for 50 to 70 percent of net new jobs (Haltiwanger *et al*., 2013; Acs and Mueller, 2008). There is debate on whether these high-growth firms are start-ups, small, medium or large. In fact, Audretsch (2012) and Walburn (2012) submit that little seems to be known about the characteristics of high-growth firms. Henrekson and Johansson (2010: 230) identified only 20 studies on high-growth firms in the period 1990 to 2008, confirming the nascent state of the literature.

Nonetheless, directing developmental assistance to this small segment of firms if they could be identified in advance or, alternatively, facilitating that other firms emulate their characteristics or practices, could accelerate job creation and reduce the unemployment rate. Some authors, for example Coad, Daunfeldt, Hölzl, Johansson and Nightingale (2014) and Derbyshire (2012), are cautious about the contribution of studies on high-growth firm for policy because a high-growth firm

at time t may not be such at $t+1$, making it difficult for policies to target them. Daunfeldt and Halvarsson (2014) and Hölzl (2014) empirically show this 'one-hit wonder' characteristic of high-growth firms in Sweden and Austria respectively, thus confirming the reservations of the cautious authors. But the reservations are misplaced if the motivating curiosity of the studies is not the identity of a high-growth firm *per se* but its characteristics and practices which, when discerned successfully, could inform policy to target firms with similar traits in $t+1$ and thereafter, thus contributing to policy.

Although the empirical literature is still emerging, high-growth firms are drawing increasing interest from policy makers in developed economies. In developing countries where unemployment rates are perennially high, enterprise development policies tend to regard MSMEs as homogenous such that policy interventions are generic. High-growth firms do not feature in policy discussions in developing countries and, except for the cross-country study of 11 African countries by Goedhuys and Sleuwaegen (2010), there is a dearth of related analyses in Africa. In line with Goedhuys and Sleuwaegen (2010), this chapter seeks to stimulate discussions on high-growth firms in Africa. It focuses on South Africa, which Goedhuys and Sleuwaegen (2010) did not include in their study.

In South Africa, enterprise development is an important policy to address unemployment and integrate society (NPC, 2011). One of the key policy frameworks supporting these goals is the BBBEE legislation, which requires established organisations to spend proportions of their net revenues on enterprise development and procure some of their inputs from black-owned firms. A study into the characteristics of firms creating most jobs is thus important to inform policy on whether interventions have been useful and on how they can be improved.

In order to determine the characteristics of firms creating most jobs, enterprise data from at least two periods is necessary. However, reliable data in such form is difficult to gather from small firms. A review of empirical studies on small businesses in South Africa reveals that studies are mostly qualitative, typically reviewing changes in legislation and policies on enterprise development (Daniel, 2004; Rogerson, 2004; 2008; McGrath, 2005), describing characteristics of small business owners (Rwigema and Karungu, 1999), and obstacles faced by small business owners (Ladzani and Netswera, 2009; Lotz and Marais, 2007). When quantitative, studies identify common attributes of obstacles faced by the business owners (Unger *et al*., 2009; Fatoki and Garwe, 2010; Nieman, Visser, and van Wyk, 2008).

Given the state of the small businesses literature in South Africa, the relationship between enterprise characteristics (for example level of education of the business woner, firm size and age, access to finance etc.) and enterprise performance are underexplored. Relatedly, Nichter and Goldmark (2009: 1459) observed that in developing countries, little is known about the characteristics' "relative importance or how they interact with each other" to influence growth. In

light of the growing body of evidence on high-growth firms, it is perhaps more beneficial to relate certain characteristics to such firms and explore the interaction effects of the characteristics than to the generality of enterprises.

To investigate the characteristics of firms that create more jobs in South Africa, a sample of 749 firms from the WBES of 2007 was used. The sample has firms with 5 to 250 employees, and the analysis has two stages. Given the exploratory nature of the theme of this chapter, the first stage determines growth characteristics of firms that create more jobs than an average firm. In this stage, firms are outperformers if they generated more jobs than the sample average or underperformers if otherwise. A logit regression model is then employed to determine the characteristics that most likely result in outperformers and how the outperformers differ from underperformers. The first stage also investigates the interaction effects of some of the characteristics on growth. The characteristics interacted are age group of the firm, size of the firm, ethnic origin of main owner, gender of main owner and level of education of the manager or owner.

The second stage of the analysis determines characteristics of high-growth firms. High-growth firms are a subset of outperformers but there is no consensus in the literature on when growth is high-growth. Definitions of high-growth are therefore arbitrary, hence the second stage of the analysis uses quantile regression. Quantile regression accommodates the numerous definitions of high-growth in that the importance of each characteristic for firms in different levels of growth rates can be observed.

5.2 GROWTH DETERMINANTS: THEORY AND EMPIRICAL EVIDENCE

Studies that seek to explain the growth of firms can be classified into two theoretical perspectives: the Law of Proportionate Effect (or Gibrat's law) and the knowledge spillover theory of entrepreneurship (Lotti, Santarelli and Vivarelli, 2008; Acs, Braunerhjelm, Audretsch and Carlsson, 2009). Gibrat's law posits that growth rates are normally distributed such that no discernible characteristics can explain growth. Empirical analyses offer limited support for Gibrat's law, with smaller and younger firms frequently found to outperform larger and older firms (Wagner, 1992; Bigsten and Gebreeyesus, 2007). Were Gibrat's law to hold perfectly, then interventions to support MSMEs would be difficult to justify. Indeed many authors argue that the most effective way of promoting enterprise growth is by ensuring that an enabling business environment exists and that such an enabling environment is realised if the regulatory burden on start-ups and smaller firms in, for example, registrations, taxes, and property rights, is reduced (de Soto, 2000; Beck Demirguc-Kunt and Maksimovic, 2005). While proponents of this view do not raise Gibrat's law as the basis for their policy recommendations, there is mutual preference for letting firms attend to growth challenges unaided once the regulatory obstacles are removed.

The knowledge spillover theory of entrepreneurship suggests that growth can be explained by entrepreneur- and firm-specific characteristics (Acs *et al.,* 2009). The theory is consistent with Jovanovich's (1982) passive learning model where each firm at start-up is presumed to have unique, random and unknown cost structures (and knowledge gaps) that the firm can only come to understand as it conducts its business. The cost structures determine the firm's scale of operations (i.e. size) as some knowledge is internally exploited or externalised when other employees leave with some of the knowledge to set up new firms. The aim of studies stemming from the knowledge spillover theory is to identify firm-specific factors that explain growth. Thus, studies proceeding from the knowledge spillover theory of entrepreneurship shy away from assessing the effects of macro-level factors such as business regulations on growth. Instead, they look at the actual operations of the firm: who owns the firm, how the firm is managed and how it interacts with suppliers and customers (Brown *et al*., 2005; Bigsten and Gebreeyesus, 2007; Bradford, 2007; McPherson, 1996).

Some empirical evidence on firm- and entrepreneur-specific attributes is from field experiment studies such as Banerjee and Duflo (2010) and de Mel, McKenzie and Woodruff (2008). Field experiment studies identify factors explaining growth by tracking the behaviour and transactions of small business owners post-treatment where the treatment involves being granted microloans, receiving training or both. But since the field experiment studies focus more on microenterprises and draw almost exclusively from microfinance activities in very specific locations, generalising the results to SMEs is problematic.

Empirical evidence on determinants of enterprise growth is extensive. In a review of early studies, Storey (1994) lists firm age, firm size, sector, legal form of enterprise, location, and ownership as key growth determinants. A review of studies since Storey (1994) shows an increasing number of variables explored. It is however interesting to note that 'legal form of organisation' has over time been infrequently explored except in studies covering micro enterprises. On the other hand, some determinants have gained importance in the literature and are being explored with increasing frequency. For instance, McPherson (1996) investigated if education, gender and age of small business owners explain growth. Brown *et al.* (2005) explored the growth effects of training and factors such as trade finance, loans accessed, previous work experience, and business association membership. Bigsten and Gebreeyesus (2007) examined the effects of operational efficiency measures such as output per employee on growth. These factors were found to significantly explain growth.

Most of the studies have however focused on access to finance as a determinant of growth. It would be interesting to explore if there are types of financing preferred by high-growth firms. In addition, while many studies find access to finance to be the most serious obstacle to growth, corporate governance within emerging enterprises is overlooked. Yet governance issues are quite

important when the firm solicits transactions with external stakeholders such as banks, suppliers and customers (Abor and Adjasi, 2007).

With regard to some findings on high-growth firms in the literature, Henrekson and Johansson (2010) concluded after a review of the literature that it is age rather than size that defines high-growth firms, and that if there is sector over-representation of such firms then the overrepresentation is more in the services sector than the technology sector. On the experience of the business owner, Siegel, Siegel and MacMillan (1993) showed that it is experience within the enterprise's sector which is important. Studies on high-growth firms have focused on developed economies. This study extends the discussion to South Africa building on the analysis of high-growth firms in Africa by Goedhuys and Sleuwaegen (2010).

5.3 DEFINITIONS OF HIGH-GROWTH FIRMS

Growth can be based on variables such as sales, profits, value added, net assets or number of employees. The choice of the growth indicator depends on the policy question and presents limited debates. The main issue is in defining high-growth: when is growth high-growth? Answers are many and arbitrary. In Siegel *et al.* (1993), a high-growth firm must double sales in its most recent three years. Siegel *et al.* (1993: 172) however excluded companies with "exceptionally high growth rates" so as not to skew the results.

Birch, Haggerty and Parsons (1997) set revenues of US$100 000 in the base year for the firm and stated that subsequent sales growth must be at least 20 percent per annum for three years. According to the Organisation for Economic Co-operation and Development (OECD), a high-growth firm must increase its revenue by more than 20 percent per year for three consecutive years given that the firm is less than five years old and has at least ten employees (OECD, 2011). Barringer, Jones and Neubaum (2005: 664) used three year compound annual growth in sales of at least 80 percent to define high-growth.

Henrekson and Johansson (2010: 228) proposed that high-growth firms be defined as a proportion of the fastest growing firms, thus circumventing the arbitrary benchmarks. In spite of the different definitions, there seems to be consensus in the literature that high-growth firms account for 3 to 9 percent of firms in an economy. A global survey by the GEM in 2011 found that "high-growth entrepreneurs represent only 4 percent of the total entrepreneurs … yet the businesses they have founded or co-own created close to 40 percent of the total jobs generated by all entrepreneurs who responded to the survey" (GEM, 2011: 1). Goedhuys and Sleuwaegen (2010: 38) explored how comparable the prevalence rate of high-growth firms in Africa is to developed economies and found the prevalence rate comparable at 5 to 9 percent of total firm distribution. This chapter contributes to this emerging discussion of high-growth firms in Africa by focusing on South Africa, where job creation is a subject of significant policy interest.

5.4 METHODOLOGY 5.4.1 Determining growth

Since the policy problem is job creation, the study uses employment growth. Typically, studies that use employment growth (e.g. Dihn *et al.*, 2010; Ayyagari *et al*., 2008) estimate growth as the log difference in the number of full-time employees between two periods:

$$\mathrm{gr}_{\mathrm{emp}_{\mathrm{it}}} = \frac{\mathrm{lnEmp_{it}} - \mathrm{lnEmp_{i,t-1}}}{\mathrm{N}} \quad \ldots(5.1)$$

where $\mathrm{gr\_emp_{it}}$ is the growth of firm i at time t, $\mathrm{Emp_{it}}$ is the number of its full-time employees at the end of the later period, $\mathrm{Emp_{i,t-1}}$ at the end of the earlier and N is the number of years between the two periods.

The relative growth in Equation 5.1 will show higher growth rates for smaller firms because of their lower base. A smaller firm is in fact expected to experience rapid growth according to the minimum efficient size hypothesis, which posits that the smaller firm or start-up business must quickly reach a set operational scale to maintain presence in a given sector (Acs and Audretsch, 1989). When on the other hand an absolute measure of growth, such as the actual number of jobs created, is used, a larger firm expectedly recruits more workers and perhaps plays a more important role in reducing the absolute number of the unemployed. While the sheer numbers of smaller enterprises are presumed to result in more jobs by smaller firms, the demonstrated higher job-churning rate of smaller firms (Kerr *et al.,* 2014) make the choice of using relative or absolute measures of growth important.

To mitigate overstating the growth propensity of small firms in relative growth measures and large firms in absolute growth measures, the Birch Index combines both measures as follows

$$\text{Birch Index} = (\mathrm{Emp_t} - \mathrm{Emp_{t-1}})\,\frac{\mathrm{Emp_t}}{\mathrm{Emp_{t-1}}} \quad \ldots(5.2)$$

This study follows Hölzl (2014; 2009) and Almus (2002) in employing the Birch index in all estimations. The study uses the natural log of the index defined as:

$$\text{Birch Index} = (\mathrm{lnEmp_t} - \mathrm{lnEmp_{t-1}})\,\frac{\mathrm{lnEmp_t}}{\mathrm{lnEmp_{t-1}}} \quad \ldots(5.3)$$

5.4.2 Determining high-growth

Before studying high-growth firms, it is perhaps important to appreciate characteristics of firms that create more jobs than an average firm. This chapter refers to such firms as outperformers. To identify outperformers, the average growth rate is determined and firms with above average growth, the outperformers, are coded 1 and 0 for underperformers when below average.

5.4.3 Outperformers and underperformers: logit regression

Given a set of hypothetical characteristics informed by empirical literature, what are the odds that a firm will be an outperformer rather than an underperformer? Since it has already been determined which firms belong to either group based on their observed growth, what in essence is sought by the question is whether the conditional factors will be useful in correctly assigning firms to the outperformers or underperformers category even when the actual growth is unknown. If for brevity's sake all the conditional factors are referred to as X, and the goal is to predict an outcome termed Y and coded 1 for outperformers and 0 for underperformers, then the problem can be defined as

$$\mathrm{P} = \mathrm{E}[\mathrm{Y} = 1 \mid \mathrm{X}] = \mathrm{X}\beta \qquad \ldots(5.4)$$

The dichotomous outcome motivates the use of a binary logit regression model which this chapter uses. The chapter also examines the extent to which interactions of conditional factors (or characteristics) are useful in classifying firms into the two categories. The interaction term is a pair of variables from the list of firm and market characteristics presented in Section 5.5.

5.4.4 High-growth firms: quantile regression

OLS regression is the commonly used method to estimate the effects of the factors on growth. The weakness of a basic OLS model is that it estimates "the mean effects of the explanatory variables" on growth (Goedhuys and Sleuwaegen, 2010: 40) such that when the subjects of the analysis have highly heterogeneous characteristics, the reported results have weak explanatory power. Evidence of this problem is indeed the very low R-squared statistics in most of the OLS-based studies. A review of a dozen studies by Coad (2009) for instance shows half with R-squared less than 5 percent which, according to Parker *et a*l. (2010: 208), suggests that "the hypothesis that growth is a random walk cannot easily be dismissed".

An alternative to basic OLS regression is quantile regression. Quantile regression is a special case of OLS in that it splits the dependent variable into percentiles which are arguably more homogenous than the full sample. Thus, the expectation is that a quantile model would be more robust as measured by R-squared than a basic OLS model. Essentially, a standard linear regression model is used for the quantile regression. The standard linear regression model is as follows:

$$g_i^q = \beta_0^{\mathrm{q}} + \beta_1^{\mathrm{q}} + \beta_2^{\mathrm{q}} \ldots \beta_{\mathrm{n}}^{\mathrm{q}} + \varepsilon \qquad \ldots(5.5)$$

where g_i^q is the Birch Index for each firm in a group that is specified by q, q is a percentile between 1 and 99 percent, β is the coefficient for each of the covariates and ε is the error term. Since the focus is on firms that grow much faster than the generality of others, deciles starting at the 50

percentile will be analysed and attention in the interpretation of results will be on the upper two deciles where high-growth firms reside.

5.5 DATA

Data used are from the 2007 WBES in South Africa. The study focuses on firms with 5 to 250 employees so that the study results can be related to others in the emerging literature on high-growth firms (Goedhuys and Sleuwaegen, 2010; Nightingale and Coad, 2013; Hölzl, 2009). Table 5.1 gives definitions and mean statistics of the characteristics to be evaluated. The characteristics are listed under three categories: firm, market and business environment.

Table 5.1 shows that outperformers are on average younger and smaller than underperformers. On average, outperformers start operation with fewer employees (i.e. ten employees) than underperformers (23 employees). From other studies such as Almus (2002) and Goedhuys and Sleuwaegen (2010), there is a basis to suppose that outperformers would be innovative, subscribe to quality standards such as ISO 9002 etc. and use more modern technology proxied by a firm having its own website. This appears not to be the case for outperforming enterprises in South Africa, with fewer outperformers using modern technology and holding lesser quality certifications such as ISO 9000, 9002 etc. for their products.

The work experience of managers does not seem to distinguish outperformers and underperformers in Table 5.1. However the managers of outperformers have comparatively lower levels of formal education. A comparatively larger proportion of Asian- and African-owned firms are outperformers than underperformers. It is difficult to draw conclusions on the market characteristics in Table 5.1. However, it is evident that outperformers suffer less regulatory intrusion proxied by lower percentage visits by tax officials and management time spent on regulatory issues. In particular, only 40 percent of outperformers were visited by tax officials compared to 48 percent of underperformers.

This section gave an overview of characteristics of outperformers. The limitation of the discussion thus far is that it is not possible to infer the degree to which these characteristics differ between outperformers and underperformers. The logit and quantile regression results address this limitation.

Table 5.1: Outperformers vs. underperformers – comparing means of characteristics

	Variable	Outperformers	Underperformers
	Total number of firms in the samples	249	500
Firm:	Number of jobs created from 2003 to 2006	15.55	4.94
	Firm age in years	14.63	19.55
	Number of employees at start-up	10.67	23.10
	Percentage of firm held by main shareholder	78.56	72.98
	Firms size with 1 being small and 2 medium	1.55	1.67
	Sector: 1 is retail; 2 is services; 3 is manufacturing	2.51	2.42
	Quality: % of firms with ISO 9000, 9002, etc.	24.50	35.40
	Audit: % of firms with annual audit of accounts	73.90	78.60
	Website: percentage of firms with own website	40.96	47.20
	Education level (4 levels: 4th is university)	1.98	2.17
	Training – percentage of firms that train workers	34.54	45.80
	Experience of top manager in years	14.75	15.65
	Gender: % of firms with female as shareholder	18.78	22.52
	African-owned	31.73	23.60
	Asian-owned	31.33	28.40
	European-owned	36.95	48.00
Market:	Average sales (ZAR)	20,400,000	34,600,000
	Management time per week spent on regulations (%)	6.79	7.14
	Exports: % of direct exports in sales	10.84	18.64
	Percentage of firms that applied for loan	22.89	22.40
	Overdraft: % of firms with overdraft	50.60	60.60
	Percentage creditors' financing in working capital	58.52	63.67
	Percentage of total trade credit in working capital	22.01	23.03
	Percentage of firms visited by tax official	38.96	48.40
	Number of years firm has known main supplier	10.20	13.04
Business environment:	Crime as obstacle on 1 to 4 scale; 4 is most serious	2.15	1.94
	Percentage of firms paying for security	69.88	81.80
	Electricity as obstacle on 1 to 4 scale; 4 most serious	1.06	1.21
	% of firms reporting having a generator	13.51	21.91
	Transport as obstacle on 1 to 4 scale; 4 most serious	0.46	0.44
	Percentage of firms with own transport	70.81	70.79

Source: Author's estimations from Enterprise Survey South Africa (2007)

5.6 RESULTS

The goodness-of-fit-test for the logit model is presented in Table 5.2. The model correctly classifies 73 percent of the 700 firms analysed. Specifically, 89.63 percent of underperforming firms are

correctly classified by the model while 40 percent of the outperforming firms are correctly classified. While the model is quite robust in identifying underperforming firms, the comparatively lower Sensitivity measure in the goodness-of-fit test shows that there is scope for more variables to be explored to understand outperforming firms better. It must be noted also that the sample for outperformers is comparatively small, with 249 firms against 500 underperformers, which to some extent explains why the model is more robust in correctly classifying underperformers than outperformers.

Table 5.2: Goodness-of-fit test for logit model

	-------TRUE-------		
Classified	D	~D	Total
+	95	48	143
-	142	415	557
Total	237	463	700
Classified + if predicted Pr(D) >= .5 True D defined as growth != 0			
Sensitivity measure	Pr(+ D)	40.08%	
Specificity measure	Pr(- ~ D)	89.63%	
Positive predictive value	Pr(D +)	64.43%	
Negative predictive value	Pr(~ D -)	74.51%	
False + rate for true ~D	Pr(+ ~D)	10.37%	
False - rate for true D	Pr(- D)	59.92%	
False + rate for classified +	Pr(~ D +)	33.57%	
False - rate for classified -	Pr(D -)	25.49%	
Correctly classified			72.86%

Note: the sensitivity measure (95/237) reports the proportion of firms in the outperformers' category that are correctly classified by the model. The specificity measure (415/463) reports the proportion of firms in the underperformers' category that are correctly classified by the model. The false positive and false negative classification error rates are 48/463 and 142/237 respectively.

Source: Author's estimations based on World Bank Enterprise Surveys (2007)

The logit model results contrasting outperformers and underperformers are discussed in Section 5.6.1 and the results on high-growth firms from the quantile regression model follow in Section 5.6.2.

5.6.1 Characteristics of outperforming firms

Table 5.3 reports the logit regression results. Four key observations emerge for discussion: the number of employees a firm had at start-up, ethnic origin of main owner, managers' experience, and business environment constraints. As noted in the previous section, outperformers have fewer employees at start-up than underperformers. Firms owned by previously disadvantaged South Africans are more likely to be outperformers and this likelihood is higher for black-owned firms. All else being constant, a black-owned and an Indian-owned firm are respectively 1.7 times and 1.6

times more likely to create a job than a white-owned firm. Relative to firms with managers who have more than 10 years' experience, enterprises with managers who have less experience are more likely to be outperformers. This likelihood is higher for the least experienced managers, who are 1.8 times more likely to turn their firms into outperformers than managers with over 10 years of experience.

Table 5.3: Logit regression results - outperformers and underperformers

	Coefficient	Odds ratio	P-value	95% Confidence interval for odds ratio	
log of firm age	-0.449	0.638	0.102	0.373	1.093
log of no. of workers at start-up	-0.604	0.547	0.000	0.446	0.669
experience	0.021	1.021	0.109	0.995	1.047
dummy: exports	-0.201	0.818	0.453	0.484	1.383
dummy: training	-0.206	0.814	0.285	0.558	1.187
trade credit	-0.002	0.998	0.722	0.989	1.008
dummy: up to secondary education	0.151	1.163	0.545	0.714	1.894
dummy: vocational education	0.080	1.083	0.717	0.703	1.669
dummy: university education	(base)	(base)			
dummy: owner ethnic origin African	0.529	1.697	0.022	1.080	2.668
dummy: owner ethnic origin Asian	0.477	1.612	0.028	1.053	2.469
dummy: owner ethnic origin European	(base)	(base)			
dummy: up to 5 years' experience	0.589	1.801	0.097	0.899	3.610
dummy: 6 to 10 years' experience	0.335	1.398	0.224	0.814	2.401
dummy: over 10 years' experience	(base)	(base)			
dummy: young firms (1 to 5 years)	-0.043	0.958	0.937	0.332	2.762
dummy: mature firms (6 to 15 years)	-0.082	0.921	0.808	0.477	1.780
dummy: old firms (above 15 years)	(base)	(base)			
working capital to debt	0.001	1.001	0.890	0.991	1.010
% held by largest owner	0.005	1.005	0.217	0.997	1.012
dummy: firm has website	-0.383	0.682	0.064	0.455	1.023
dummy: firm has overdraft	-0.179	0.836	0.337	0.579	1.205
dummy: firm was audited	0.002	1.002	0.994	0.646	1.553
dummy: female	-0.157	0.855	0.484	0.551	1.326
log of 2003 sales	0.158	1.171	0.042	1.006	1.364
transport as an obstacle	0.102	1.108	0.345	0.896	1.369
crime and theft as an obstacle	0.112	1.119	0.129	0.968	1.293
electricity as an obstacle	-0.086	0.918	0.252	0.793	1.063
constant	-1.300		0.428		
R-squared	0.104				
Number of outperformers (p=1)	249				
Number of underperformers (p=0)	500				

Source: Author's estimations from Enterprise Survey South Africa (2007)

It is also informative to assess the interaction effects of some independent variables and the extent to which such interaction terms determine whether a firm will be an outperformer or an underperformer. The study observed 39 interaction terms listed along with respective results in Table 5.4.

With regard to interactions effects on Young firms and starting with levels of education presented in the first set of rows of Table 5.4, firms run by managers with up to secondary school education are more likely to be outperformers. Young Asian-owned firms and young white-owned firms are more likely to be outperformers, with the odds being 1.3 times for Asian-owned firms and 2.7 times (and significant) for white-owned firms. Mature firms run by vocationally trained and by university graduates have a higher likelihood of being outperformers. However, it is old firms run by managers with secondary education that are significantly more likely to be outperformers, the odds ratio being 2.5 times.

On gender, although there is insufficient evidence to be conclusive, firms owned by white females have the highest likelihood of outperforming over other gender and ethnic origin interactions. From the results in Table 5.4, it seems that medium-sized firms are more likely to be outperformers than small firms except when the small firms are white-owned. Interaction results of ethnic origin and levels of education, though all statistically not significant, exhibit consistent patterns that must be noted. For Asian-owned and black-owned firms, the odds of being an outperformer decrease with higher levels of education but increase with higher levels of education for white-owned firms, from 0.7 times at secondary school to 1.6 times at university.

Table 5.4: Interaction effects in logit regression on outperformers and underperformers

Interaction		Odds Ratio	P-value	[95% Confidence Interval]	
Firm age group and education	Young & Secondary school	1.715	0.261	0.669	4.397
	Young & Vocational	0.617	0.239	0.276	1.379
	Young & University	1.116	0.818	0.44	2.828
	Mature & Secondary school	0.323	0.002	0.16	0.654
	Mature & Vocational	1.853	0.062	0.97	3.541
	Mature & University	1.477	0.263	0.747	2.924
	Old & Secondary	2.459	0.015	1.191	5.074
	Old & Vocational	0.727	0.357	0.37	1.431
	Old & University	0.701	0.306	0.356	1.383
Firm age group and ethnic origin	Young & Black	0.356	0.016	0.154	0.823
	Young & Asian	1.274	0.582	0.538	3.015
	Young & White	2.666	0.032	1.086	6.547
	Mature & Black	1.684	0.146	0.834	3.403
	Mature & Asian	0.922	0.821	0.458	1.857
	Mature & White	0.696	0.271	0.365	1.327
	Old & Black	1.280	0.522	0.601	2.728
	Old & Asian	0.926	0.827	0.464	1.848
	Old & White	0.898	0.75	0.464	1.739
Ethnic origin and education	Black & Secondary School	1.071	0.855	0.51	2.25
	Black & Vocational	1.026	0.94	0.521	2.021
	Black & University	0.968	0.934	0.446	2.101
	Asian & Secondary school	1.424	0.364	0.664	3.055
	Asian & Vocational	1.186	0.625	0.598	2.353
	Asian & University	0.613	0.181	0.3	1.255
	White & Secondary school	0.692	0.313	0.339	1.414
	White & Vocational	0.897	0.738	0.475	1.694
	White & University	1.624	0.155	0.832	3.169
Ethnic origin and gender	Black & Female	0.925	0.85	0.414	2.068
	Black & Male	1.095	0.825	0.49	2.448
	Asian & Female	0.649	0.336	0.269	1.567
	Asian & Male	1.541	0.336	0.638	3.723
	White & Female	1.677	0.219	0.736	3.821
	White & Male	0.65	0.294	0.291	1.452
Ethnic and size	Black & Small	0.855	0.686	0.399	1.832
	Black & Medium	1.134	0.743	0.535	2.405
	Asian & Small	0.835	0.642	0.389	1.789
	Asian & Medium	1.318	0.475	0.618	2.808
	White & Small	1.357	0.408	0.658	2.798
	White & Medium	0.752	0.429	0.371	1.523

Source: Author's estimations from the World Bank Enterprise Surveys in South Africa (2007)

5.6.2 Characteristics of high-growth firms

The results of the quantile regression model are in Table 5.5. The second column in Table 5.5 reports the basic OLS regression often used to investigate growth characteristics of firms (Naudé *et al.,* 2008; Brown *et al*., 2005; McPherson, 1996). The next column reports effects of the characteristics on firms in the fifth decile or Q50 per the Table 5.5 notation. Given that high-growth firms are at the right hand tail of the distribution of growth rates, the discussion on results focuses on the Q80 and Q90 results, which in essence incorporate the numerous definitions of high-growth firms in the literature (Henrekson and Johansson, 2010: 228).

There is a negative and significant relationship between size at start-up (i.e. log of number of workers at start-up) and growth. The effect increases with higher growth rates. This means that the higher the number of employees a firm has at formation, the less likely it is to be a high-growth firm. Firm age exhibits a similar pattern. In relation to young firms (which are not listed in Table 4 as it is the reference category for age groups), mature firms perform poorly across all deciles reported but when related to old firms, younger firms outperform in the lower deciles but underperform in Q70, Q80 and Q90, albeit insignificantly. Therefore, from the sample of firms assessed, there is inadequate evidence to associate high-growth firms with a particular age group. In the previous section, young firms were more likely to be outperformers. Results in this section show that the contribution of young firms to job creation does not meet the high-growth firm criteria on the upper two deciles. Thus, all things being equal, while young firms create more jobs than the average firm in the sample, there is insufficient evidence to conclude that they reside in the top deciles of high-growth. It is therefore important to address the binding and top constraints for young firms to propel the firms into the high-growth zone.

With regard to experience, the results provide evidence that high-growth firms can be associated more with managers with up to 10 years' experience than over 10 years. The association is stronger with moderately experienced managers (i.e. managers with between 6 and 10 years' experience). The results provide evidence that African-owned firms are more likely to be high growth-firms. In relation to Asian-owned firms, African-owned firms in Q80 and Q90 associate positively with growth. On the other hand European-owned firms underperform Asian-owned firms and the underperformance is significant at the top quantile, while the outperformance by African-owned firms is significant. A plausible explanation for the underperformance of white-owned firms could be that the set of further regulatory requirements they must comply as they increase the number of employees. Employment Equity requirements compel firms to meet set quotas for black employees. Such employees may lack the necessary skills and experience or be too expensive for the firm. It is likely that some white-owned firms may prefer to remain small to avoid such additional regulatory burden. Future research is necessary to explore this and other explanations of the underperformance. What would also be useful to explore in such studies are the cultural incentives

and value systems of business owners – some of which could be ethnic-driven – where, for example, some business owners may regard financial capital growth as more important than having many employees and vice versa.

Table 5.5: Results of quantile regression on growth

	OLS	Q50	Q60	Q70	Q80	Q90
log of firm age	-0.111	-0.034	-0.039	-0.095	-0.136	-0.181
	0.027	*0.428*	*0.232*	*0.164*	*0.061*	*0.140*
dummy: mature	-0.031	-0.072	-0.059	-0.007	-0.032	-0.051
	0.633	*0.199*	*0.165*	*0.938*	*0.754*	*0.769*
dummy: old	0.011	-0.055	-0.051	0.050	0.030	0.037
	0.916	*0.537*	*0.444*	*0.721*	*0.857*	*0.894*
log of no. of workers at start-up	-0.123	-0.063	-0.087	-0.116	-0.150	-0.171
	0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.001*
experience	0.005	0.001	0.004	0.005	0.007	0.012
	0.071	*0.632*	*0.009*	*0.117*	*0.044*	*0.022*
dummy: 6 to 10 years' experience	0.021	-0.004	-0.036	-0.077	-0.075	0.074
	0.702	*0.932*	*0.317*	*0.304*	*0.386*	*0.605*
dummy: over 10 years' experience	0.002	-0.002	-0.064	-0.104	-0.162	-0.086
	0.977	*0.968*	*0.153*	*0.254*	*0.117*	*0.614*
dummy: training	-0.006	-0.035	-0.037	-0.013	0.025	0.019
	0.861	*0.276*	*0.115*	*0.786*	*0.639*	*0.826*
dummy: up to secondary school	0.023	0.030	0.011	0.029	-0.011	0.183
	0.630	*0.471*	*0.718*	*0.632*	*0.870*	*0.119*
dummy: vocational education	0.035	0.038	0.055	0.067	0.024	0.169
	0.409	*0.296*	*0.045*	*0.223*	*0.702*	*0.123*
dummy: Asian	-0.100	-0.018	-0.001	0.009	-0.060	-0.327
	0.035	*0.656*	*0.968*	*0.884*	*0.396*	*0.003*
dummy: European	-0.120	-0.052	-0.045	-0.031	-0.091	-0.343
	0.009	*0.185*	*0.127*	*0.604*	*0.175*	*0.001*
dummy: gender	-0.009	-0.006	-0.002	0.003	0.002	0.061
	0.827	*0.870*	*0.937*	*0.954*	*0.980*	*0.567*
dummy: exports	-0.005	0.007	-0.026	-0.061	-0.008	0.056
	0.914	*0.870*	*0.405*	*0.336*	*0.910*	*0.640*
trade credit	-0.001	-0.002	0.000	0.000	-0.001	-0.002
	0.309	*0.055*	*0.920*	*0.768*	*0.344*	*0.385*
working capital to debt	-0.001	0.000	0.000	0.000	-0.001	-0.001
	0.456	*0.990*	*0.927*	*0.964*	*0.500*	*0.516*
% held by largest owner	0.000	0.000	0.000	0.000	0.000	0.000
	0.781	*0.534*	*0.585*	*0.871*	*0.705*	*0.836*
dummy: audit	-0.017	-0.015	-0.001	0.008	-0.016	-0.120
	0.694	*0.685*	*0.984*	*0.879*	*0.800*	*0.191*
log of 2003 sales	0.013	0.023	0.029	0.011	0.019	0.016
	0.370	*0.082*	*0.004*	*0.573*	*0.402*	*0.671*
overdraft	-0.070	-0.027	-0.025	-0.016	-0.004	-0.095
	0.059	*0.396*	*0.299*	*0.736*	*0.946*	*0.306*
website	-0.074	-0.036	-0.014	-0.082	-0.043	-0.018
	0.065	*0.297*	*0.576*	*0.110*	*0.459*	*0.847*
Quality certification		-0.022	-0.014	-0.026	-0.025	0.098
		0.312	*0.653*	*0.702*	*0.639*	*0.223*
transport severity as a constraint	0.021	0.000	0.003	0.019	0.048	0.143
	0.316	*0.991*	*0.803*	*0.482*	*0.130*	*0.002*

crime severity as a constraint	0.007	0.016	0.010	-0.003	-0.017	-0.045
	0.632	*0.206*	*0.262*	*0.886*	*0.434*	*0.251*
electricity as a constraint	0.011	-0.022	-0.025	-0.005	0.003	0.052
	0.467	*0.079*	*0.009*	*0.777*	*0.881*	*0.168*
constant	0.732	0.308	0.214	0.832	1.081	1.686
	0.018	*0.188*	*0.229*	*0.022*	*0.013*	*0.020*
Adjusted R-squared	0.126	0.057	0.072	0.087	0.119	0.192
Number of firms	700	700	700	700	700	700

Source: Author's estimation from Enterprise Survey South Africa (2007)

With regard to education, the results show that in relation to low levels of formal education (i.e. up to secondary school) vocationally trained managers influence growth. Overall, university graduates underperform the less formally educated managers but all education levels effects are not statistically significant. However, results show that enterprise performance is improved by in-house training programmes for workers. This is shown by the effects of training which turn positive at Q80 and Q90. There are no discernible patterns that emerge on working capital related characteristics. However, firms with overdraft facilities have a consistently negative relationship with growth.

Goedhuys and Sleuwaegen (2010) proxied innovation by whether a firm has a website or holds quality certifications such as ISO 9000, and found positive associations with high-growth firms. The explanation for a positive association by Goedhuys and Sleuwaegen (2010) is that websites mitigate transport and communication obstacles. The results of this study however show a persistently negative association of own-website with growth as with quality certification, although the latter is positive at Q90. There is thus insufficient evidence in this study to associate these proxies of innovation with high growth. Interestingly, transport as an obstacle has positive effects on growth and this effect is significant at Q90. It could be, as Denrell and Liu (2012) cautioned, that high-growth firms may not necessarily reflect the ability of entrepreneurs but structural faults in an economy which encourage opportunistic behaviour rather than innovation. Importantly, crime negatively affects high-growth firms, affirming the earlier finding (see Chapter 3) of crime as the overall binding constraint for firms.

5.7 IMPLICATIONS FOR POLICY AND RESEARCH

Four findings need further discussion for policy and research. Firstly, the typical high-growth firm is likely to be black-owned. This may seem rather intuitive since 80 percent of the population is black. However, this is an important finding given that African-owned firms accounted for 26 percent of the 749 firms analysed against 29 percent and 44 percent for Asians and Europeans respectively. Secondly, it appears that young firms create more jobs than mature firms but that the outperformance slides as firms get to be over 15 years. A possible explanation for this is that the formal African-owned enterprises are largely post-1994 (Rogerson, 2004). Government support, especially the BBBEEE requirements, may have helped the emerging black entrepreneur.

However, interaction terms results show that black-owned firms which are five years or younger are less likely to outperform, suggesting the need for further research to determine obstacles that are perhaps peculiar to this category of firms.

Thirdly, the chapter did not find sufficient evidence to associate exports with outperformance but this should not be taken to mean that exports do not influence growth. The problem, as shown by Soderbom and Teal (2003), is that few SMEs in Africa are exporters. There is therefore need for further research into barriers faced by the few exporting SMEs and firms that attempt to export.

Finally, this chapter used variables gathered in the WBES instrument to explore the extent to which the variables explain firms creating most jobs. Other studies not based on WBES extensively explore the variables used in this chapter. As discussed in Section 5.4.4, there is an established concern in the literature that the variables used in empirical studies poorly explain the performance as demonstrated by low R-squared statistics in OLS-based studies.

The quantile regression results in this chapter showed the R-squared statistic increasing with higher deciles, from 6 percent in the OLS results to 7 percent in the fifth decile (Q50) and 19 percent in Q90. The goodness-of-fit test of the logit regression model used in this chapter predicted 89 percent of underperformers correctly but only 40 percent of outperformers correctly. Could it be that these well-established or *default* variables such as firm age, ethnic origin, gender sector, education, experience etc. are inherently weak in explaining high-levels of firm performance? Perhaps there should be more emphasis in innovation-related variables in the literature than is presently the state of MSME literature in developing countries. Determining what such variables could be is beyond the scope of this study but would be an important subject for future research.

5.8 CONCLUSION

This chapter is a modest effort to stimulate discussions on high-growth firms in South Africa. The chapter determined characteristics of firms that create more jobs than an average firm does. The chapter referred to such firms as outperformers. High-growth firms are an upper subset of outperformers. The results suggest that young firms are more likely to be outperformers but the typical high-growth firm is more likely to be black-owned and perhaps more than five years old. The limitation of the analysis is that only characteristics in the WBES instrument could be explored. It is evident from the chapter that the variables gathered by the WBES are relatively weak in explaining outperforming firms and high-growth firms. This suggests that there are perhaps better variables characterising high-growth firms than are presently explored in the literature. Alternatively, the weaknesses of the variables in explaining high-growth firms may be confirming their relatively small size of 3 to 9 percent of firms in an economy. Further research could perhaps use larger samples and more in-depth survey instruments to pick characteristics that explain high-growth firms better.

CHAPTER 6: SUMMARY, RECOMMENDATIONS AND CONCLUSION

6.1 SUMMARY OF KEY FINDINGS

The thesis set out to identify the factors in the WBES (2003, 2007) and WBFCS (2010) data that play a most important role in constraining the growth of MSMEs in South Africa. It also set out to determine characteristics of firms creating most jobs. The goal was to explore through these investigations, interventions in the MSME sector that may perhaps improve the socioeconomic circumstances of many South Africans who are unemployed or running the six million or so small businesses in the country.

The motivation of the research was firstly in the debate on whether small businesses reduce unemployment. The argument for promoting MSMEs is that their sheer numbers make it plausible that their growth will lead to job creation, social cohesion and equity. Secondly, the socioeconomic context of high unemployment and high levels of social and income inequality in South Africa and the fact that the government emphasises the importance of MSMEs in addressing the challenges motivated the focus on South Africa. Thirdly, the theoretical rationalisations within the market failure hypothesis which posits that it is essential for policymakers to intervene in markets in order to improve allocation and productivity of available resources affirm the need for empirical analyses to identify and inform such interventions. Accordingly, the thesis systematically studied challenges of MSMEs and characteristics of high-growth firms to explore approaches for promoting small businesses to foster socioeconomic development.

Chapter 2 presented the contextual background to the subsequent empirical analyses in the thesis. The chapter reviewed the small enterprise development policy highlighting key institutions involved in implementing the policy and discussed the importance of BBBEE legislation in enterprise development. The chapter demonstrated the unfavourable socioeconomic environment in South Africa by comparing the country to peer economies. These comparisons also demonstrated significant differences between South Africa and other countries to show that recommendations from the cross-country literature may not be appropriate for the peculiarities of a country of interest. The subsequent chapters used the WBES data of 2003 and 2007 and the WBFCS of 2010 to understand MSMEs and their operating environment in South Africa.

Chapter 3 investigated the main obstacles to growth of MSMEs, basing the analysis on how business owners and managers rated the 15 business environment obstacles in the WBES instrument. The relative importance of each obstacle was determined by evaluating how it affected employment growth. The chapter used two count-based approaches and two further approaches based on the Growth Diagnostic framework by Hausmann *et al.* (2005) to determine the key obstacles and the extent to which the obstacles constrained job creation. The count-based

approaches and the first approach based on the Growth Diagnostic framework found that crime, theft and disorder is the binding constraint for MSMEs, which, if addressed, result in optimal growth even when all other obstacles remain unchanged. Infrastructure-related obstacles, particularly electricity supply and transport, emerged as the next set of obstacles with significant effects on growth. The second Growth Diagnostic approach showed that medium-sized enterprises were least affected by the businesses environment obstacles, suggesting that support would be more useful to micro and small firms. Chapter 3 showed that access to finance is a relatively less important obstacle for MSMEs in South Africa.

Access to finance is an important issue in the small business literature with many studies showing finance as the most binding constraint to growth. Chapter 4 conducted an in-depth study of the financing constraint using two approaches. The first approach continued the analysis from Chapter 3 which was based on the feedback from business owners on how they assessed access to finance as affecting their operations. The feedback from the 2003 and 2007 WBES showed that the importance of access to finance as an obstacle declined significantly. The chapter found that firms reporting finance to be a major obstacle did not underperform firms that rated finance as not a problem. The second approach identified firms that encountered challenges as they sought to raise external finance. The objective in the second approach was to determine first, if such firms existed and second, their profile. The chapter identified four levels of finance constraint: Fully Credit Constrained, Partially Credit Constrained, Maybe Credit Constrained and Non Credit Constrained. The investigation found, using an ordered logit model, that black-owned firms, firms less than five years old and firms in the manufacturing sector have high likelihoods of encountering problems in accessing finance.

Chapter 5 explored the characteristics of high-growth firms in South Africa. Given the arbitrary definition of high-growth in the literature, Chapter 5 adopted two approaches. The first approach investigated the characteristics of firms creating more jobs than the average firm in the sample does using a binary logit regression model, while the other used quantile regression so as to observe the characteristics of firms at different levels of growth rates. The chapter found that young firms (i.e. less than six years old) created more jobs than the average firm in the sample particularly young white-owned firms and old firms with more experienced managers. There was however, insufficient evidence for such young firms to qualify as high-growth firms, which by definition, must reside in upper end of the distribution of growth rates. Evidence suggested that the typical high-growth firms were more likely to be black-owned firms which are perhaps more than six years old.

6.2 IMPLICATIONS OF FINDINGS FOR MSME DEVELOPMENT POLICY

Young firms emerge consistently across the analyses of the thesis as warranting some attention. Chapter 2 showed that in the random WBES sample of firms used, young firms accounted for 69 percent of micro enterprises, 45 percent were small firms and 17 percent were medium-sized firms. Young firms therefore are mainly micro and small enterprises. In investigating the binding constraints, young firms were significantly affected by more obstacles than other categories of enterprises, with the main obstacles being crime, informal sector competitors and transport. In examining the finance constraint, young firms were more likely to be towards the worst categories of the Fully Credit Constrained category. Yet it emerged in Chapter 5 on high-growth firms that young firms are more likely to be outperformers if they are white-owned, while young black-owned firms are significantly less likely to outperform the generality of MSMEs. Before relating these findings on young firms to policy, it is necessary to run through the key findings on black-owned firms.

Whereas crime was the binding constraint for most categories of firms and for MSMEs as a group, the binding constraint for black-owned firms using the first approach of the Growth Diagnostic framework was tax administration. In the second approach of the Growth Diagnostic framework, four constraints affected small black-owned firms significantly: courts, customs and regulations, electricity, and tax administration. With regard to the finance constraint, black-owned firms as mentioned above are more likely to experience significant challenges in accessing external finance as was found for young firms. While black-owned young firms are significantly less likely to be outperformers, black-owned firms that are more than six years old are significantly likely to be in the top two deciles of job creators defined as high-growth firms.

In suggesting policy recommendations, it is also important to be cognisant of the fact that support to MSMEs seeks not only job creation. As demonstrated in Chapter 2, most micro and small firms are owned by individuals with lower levels of formal education who ventured into business because they could not find jobs or had just lost their formal jobs. Support to such business owners must seek to ensure that the citizens so determined to be self-reliant are encouraged to persevere – the creation of additional jobs by such business owners being perhaps a bonus. Enterprise development policy must therefore address two goals: job creation and individual business owner empowerment. The remainder of this section suggests policy recommendations for job creation. Section 6.3 discusses the empowerment of individual business owners.

With regard to job creation, it is important to acknowledge that empirical evidence globally and in South Africa shows that the generality of MSMEs do not retain the jobs they create. Thus, the focus on promoting firms that create jobs more than the generality of other firms, or at least nurturing such characteristics in the generality of firms, is important. Evidence from this study

suggests prioritisation of support to young firms. Young firms have a high likelihood of being financially constrained, which suggests that interventions for young firms must have a financing emphasis. Furthermore, the binding constraints for young and black-owned firms are tax-related, which suggests the need for the financial interventions to include training programmes to improve the appreciation of tax issues by entrepreneurs. The research showed that black-owned firms encounter significant challenges in accessing finance in spite of support such as the BBBEE. As observed in Chapter 4, an explanation for this was that this was perhaps suggestive of the enormity of the finance constraint: more still needs to be done to address the problem of access to finance.

The thesis showed that black-owned firms had fewer managers with high levels of education, particularly university education. Given evidence that higher levels of education mitigate the finance constraint, it could be useful for policy to accelerate vocational training programmes for business owners. It is also important that policy encourage blacks with high levels of formal education to set-up entrepreneurial ventures, as such start-ups could be less vulnerable to obstacles such as the finance constraint.

The limitation of the research is that it could only use variables in the WBES. This limitation was particularly evident in investigating the characteristics of high-growth firms where the predictive power of the variables used was 40 percent. Further research exploring a wider set of characteristics would enrich the literature and policy discussion on firms that create most jobs. It is particularly important, given that the typical high-growth firm may be black-owned, that future research explores how BBBEE-driven support can further address the finance constraint.

6.3 IMPLICATIONS FOR SOCIAL ECONOMY ACTORS IN PROMOTING SMALL FIRMS

The BBBEE legislation has ensured that government and the private sector undertake the promotion of small businesses jointly. The role of NGOs and local and international development agencies (hereafter referred to as social economy actors) must however not be overlooked. The goal of social economy actors is to support small business owners in a financially sustainable way. Social economy actors seek to address the underlying market failures in an economy by working with the most affected individuals and engaging other stakeholders (e.g. banks) in their activities. It is fitting to discuss how the social economy actors can contribute to addressing the main challenges encountered by MSMEs in South Africa as found by this study. It must also be acknowledged that the New Growth Path government policy of 2010 envisaged the social economy sector creating 260 000 jobs by 2020, thus underscoring the important role that the sector must play in addressing pressing social problems while creating jobs in its own right (NGP, 2011).

This thesis showed that if MSMEs are to create and retain jobs, crime, electricity and transport are the critical problems that must be addressed. A study by Alda and Cuesta (2010) estimated that

total crime costs for South Africa in 2007 were US$22 billion or 7.8 percent of GDP, making it a critical challenge. Since social economy actors engage the communities, they can organise community-driven initiatives to mitigate a social problem such as crime (K'nIfe and Haughton, 2013).

Initiatives by social economy actors could follow the 'social business' institutional framework proposed by Yunus (2007) or the social entrepreneurship proposition (Mair and Marti, 2006; Dees, 1998). Yunus (2007) described a social business as a non-dividend paying venture from which investors can only get back their initial investment. Social businesses seek to deliver social good in a financially sustainable manner. The social business model is a conceptually useful institutional framework because of the potentially poor financial returns that for-profit only ventures may earn by providing security and transport services to micro and small firms that may be unwilling or unable to pay a fair market price for commercially-priced services. This makes the social business model, which emphasises social impact, more useful to complementing government efforts to address the socioeconomic challenges.

In addition to the social business model, social entrepreneurs must be encouraged to address the critical challenges that micro and small firms encounter. Unlike social businesses that do not pay dividends to their investors, social entrepreneurs can pay dividends such that investors seeking both a financial return and delivering social good would be attracted to invest in social entrepreneurial ventures. Social entrepreneurs, unlike private sector entities that may attempt to address the socioeconomic problems for profit purposes, are at an advantage because they can raise some of their capital at lower cost from NGOs, Not-for-Profit Organisations (NPOs) and development agencies (Greater Capital, 2011). The resultant lower weighted average cost of capital for social entrepreneurs improves their margins such that they are more likely to perform well financially and pay dividends to investors while delivering social good.

There are indeed some initiatives to address crime by social economy actors in South Africa. One such example is Khulisa Social Solutions, which aims to foster enterprise development by preventing crime through collaborating with multiple stakeholders (Khulisa, 2012). It is necessary that such initiatives are supported and scaled-up by government, the private sector and the local communities.

Initiatives by social businesses and social entrepreneurs along with the traditional NGOs and development agencies are essential in promoting micro and small enterprises in South Africa. While government policy has ensured that large firms invest in MSME development through the BBBEE legislation, the role of social economy actors is important. Social economy actors' understanding of communities suggests that they are perhaps well positioned to tackle social problems such as crime. It is therefore necessary that there is appropriate legislation recognising

the emerging social economy actors such as social enterprises (ILO, 2011; Fury, 2010). Legislation recognising social enterprises would improve their operations ability to engage stakeholders such as government, NGOs, investors and the MSMEs for socioeconomic development initiatives.

6.4 CONCLUSION

The thesis used the World Bank Enterprise Surveys data to determine key obstacles to growth and the profile of firms that could expedite job creation. The results show that policies to mitigate crime must be the top priority. It is also necessary that MSMEs have access to efficient infrastructure facilities, particularly an efficient transport system for their inputs and produce and a consistent supply of electricity.

Young firms encounter more obstacles than other categories. If the goal of the policy was solely to create more jobs, firms that create more jobs seem more likely to be black-owned. Interventions that would perhaps expedite job creation must encourage educated blacks to become entrepreneurs given that firms run by entrepreneurs with higher levels of formal education reduce the effects of business environment constraints such as access to finance. Encouraging educated blacks to become business owners is however a long-term strategy. What is more urgent is training start-ups so that they are better able to secure finance, which may perhaps explain why young black-owned firms underperform the average MSME sector growth.

Further research drawing from a larger and more in-depth survey instrument would contribute to improving the understanding of MSMEs and the extent to which they contribute to creating jobs and promoting social cohesion and equity.

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APPENDICES

Appendix 1: Estimating the binding constraint for all enterprises including large firms

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
finance	0.008															0.005
	0.014															0.149
land		0.010														0.010
		0.009														0.021
Licensing			0.007													-0.001
			0.147													0.853
Corruption				0.006												0.002
				0.029												0.546
Courts					0.000											-0.004
					0.985											0.559
Crime						0.006										0.003
						0.036										0.277
Customs							0.008									0.005
							0.144									0.360
Electricity								-0.003								-0.007
								0.269								0.021
Workers' educ.									0.003							-0.002
									0.405							0.637
Labour										0.004						0.002
										0.259						0.630
Politic											0.012					0.010
											0.016					0.084
Practices												0.003				-0.001
												0.316				0.729
Tax admin													0.010			0.001
													0.064			0.881
Tax rates														0.011		0.008
														0.013		0.163
Transport															-0.001	-0.007
															0.755	0.111
Std. Error	0.003	0.004	0.005	0.003	0.006	0.003	0.005	0.003	0.003	0.004	0.005	0.003	0.005	0.004	0.004	
R-squared	0.065	0.065	0.060	0.063	0.058	0.063	0.060	0.059	0.059	0.060	0.064	0.059	0.062	0.065	0.058	0.090
Adj. R-sqd	0.055	0.056	0.051	0.054	0.048	0.053	0.051	0.050	0.049	0.050	0.055	0.049	0.052	0.055	0.048	0.065
No. of obs.	880	880	880	880	880	880	880	880	880	880	880	879	880	879	880	878

Columns 1 to 15:

$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$

Column 16: $\text{Growth} = \beta_0 + \beta$

Appendix 2: Estimating the binding constraint for MSMEs

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
finance	0.006															0.003	
	0.064															0.321	
land		0.011														0.014	
		0.001														0.000	
Licensing			0.005													-0.001	
			0.268													0.873	
Corruption				0.003												0.001	
				0.330												0.806	
Courts					-0.013											-0.014	-0.012
					0.026											0.015	0.037
Crime						0.003										0.002	
						0.272										0.559	
Customs							-0.004									-0.005	
							0.415									0.428	
Electricity								-0.004								-0.006	-0.003
								0.166								0.036	0.297
Workers' educ.									0.003							0.000	
									0.460							0.959	
Labour										0.005						0.007	
										0.184						0.094	
Politic											0.006					0.005	
											0.250					0.350	
Practices												0.000				-0.003	
												0.935				0.381	
Tax admin													0.005			0.000	
													0.314			0.977	
Tax rates														0.007		0.008	
														0.078		0.140	
Transport															-0.004	-0.010	-0.002
															0.280	0.023	0.656
Std. Error	0.003	0.003	0.004	0.003	0.006	0.003	0.005	0.003	0.004	0.004	0.005	0.003	0.005	0.004	0.004		
R-squared	0.306	0.314	0.304	0.303	0.307	0.304	0.303	0.304	0.303	0.304	0.304	0.302	0.303	0.306	0.304	0.339	0.309
Adj. R-sqd	0.297	0.305	0.294	0.294	0.298	0.294	0.294	0.295	0.294	0.295	0.294	0.292	0.294	0.296	0.294	0.316	0.298
No. of obs.	687	687	687	687	687	687	687	687	687	687	687	686	687	686	687	685	687

Columns 1 to 15:
$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$
Column 16:
$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (all obstacles at once)}$
Column 17:
$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ no. of employees} + \beta \text{ No. of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (only significant from Column 2 to 16)}$

Appendix 3: Estimating the binding constraint for medium enterprises

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
finance	0.006															0.003	
	0.064															0.321	
land		0.011														0.014	
		0.001														0.000	
Licensing			0.005													-0.001	
			0.268													0.873	
Corruption				0.003												0.001	
				0.330												0.806	
Courts					-0.013											-0.014	-0.012
					0.026											0.015	0.037
Crime						0.003										0.002	
						0.272										0.559	
Customs							-0.004									-0.005	
							0.415									0.428	
Electricity								-0.004								-0.006	-0.003
								0.166								0.036	0.297
Workers' educ.									0.003							0.000	
									0.460							0.959	
Labour										0.005						0.007	
										0.184						0.094	
Politic											0.006					0.005	
											0.250					0.350	
Practices												0.000				-0.003	
												0.935				0.381	
Tax admin													0.005			0.000	
													0.314			0.977	
Tax rates														0.007		0.008	
														0.078		0.140	
Transport															-0.004	-0.010	-0.002
															0.280	0.023	0.656
Std. Error	0.003	0.003	0.004	0.003	0.006	0.003	0.005	0.003	0.004	0.004	0.005	0.003	0.005	0.004	0.004		
R-squared	0.306	0.314	0.304	0.303	0.307	0.304	0.303	0.304	0.303	0.304	0.304	0.302	0.303	0.306	0.304	0.339	0.309
Adj. R-sqd	0.297	0.305	0.294	0.294	0.298	0.294	0.294	0.295	0.294	0.295	0.294	0.292	0.294	0.296	0.294	0.316	0.298
No. of obs.	687	687	687	687	687	687	687	687	687	687	687	686	687	686	687	685	687

Columns 1 to 15:

$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$

Column 16:

$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (all obstacles at once)}$

Column 17:

$\text{Growth} =$

$\beta_0 + \beta \log \text{of sales} + \beta \text{ no. of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (only significant from Column 2 to 16)}$

Appendix 4: Estimating the binding constraint for young enterprises

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
finance	0.008															0.009	
	0.202															0.255	
land		0.003														0.013	
		0.623														0.120	
Licensing			0.009													0.007	
			0.244													0.429	
Corruption				0.007												0.011	
				0.281												0.164	
Courts					-0.031											-0.024	-0.028
					0.018											0.107	0.031
Crime						0.006										0.002	
						0.364										0.809	
Customs							-0.007									-0.003	
							0.574									0.783	
Electricity								-0.006								-0.005	
								0.354								0.456	
Workers' educ.									-0.002							-0.009	
									0.849							0.403	
Labour										0.004						0.008	
										0.712						0.472	
Politic											-0.002					-0.007	
											0.897					0.618	
Practices												-0.013				-0.023	-0.011
												0.088				0.012	0.151
Tax admin													-0.002			-0.021	
													0.910			0.328	
Tax rates														0.014		0.027	
														0.157		0.083	
Transport															-0.016	-0.019	
															0.059	0.052	
Std. Error	0.006	0.007	0.008	0.007	0.013	0.007	0.012	0.006	0.009	0.010	0.012	0.008	0.014	0.010	0.009		
R-squared	0.318	0.311	0.317	0.316	0.338	0.314	0.312	0.314	0.310	0.311	0.310	0.322	0.310	0.319	0.328	0.432	0.323
Adj. R-sqd	0.273	0.266	0.272	0.271	0.294	0.269	0.266	0.269	0.265	0.266	0.265	0.277	0.265	0.274	0.284	0.324	0.273
No. of obs.	147	147	147	147	147	147	147	147	147	147	147	146	147	146	147	145	146

Columns 1 to 15:

$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$

Column 16:

$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (all obstacles at once)}$

Column 17:

$\text{Growth} =$

$\beta_0 + \beta \log \text{of sales} + \beta \text{ no. of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (only significant from Column 2 to 16)}$

Appendix 5: Estimating the binding constraint for African-owned MSMEs

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
finance	0.007															0.004
	0.155															0.574
land		0.012														0.010
		0.030														0.086
Licensing			0.010													0.004
			0.114													0.569
Corruption				0.007												0.001
				0.245												0.942
Courts					-0.012											-0.012
					0.363											0.375
Crime						0.007										0.004
						0.201										0.471
Customs							-0.010									-0.017
							0.436									0.203
Electricity								-0.006								-0.007
								0.210								0.167
Workers' educ.									0.004							0.007
									0.627							0.432
Labour										0.008						0.006
										0.432						0.585
Politic											0.006					-0.005
											0.586					0.694
Practices												0.010				0.002
												0.112				0.724
Tax admin													-0.007			-0.031
													0.501			0.025
Tax rates														0.013		0.026
														0.096		0.016
Transport															-0.001	-0.008
															0.849	0.309
Std. Error	0.005	0.005	0.006	0.006	0.013	0.005	0.012	0.005	0.007	0.010	0.010	0.006	0.010	0.008	0.007	
R-squared	0.259	0.268	0.261	0.257	0.255	0.258	0.255	0.258	0.253	0.255	0.254	0.261	0.254	0.262	0.253	0.321
Adj. R-sqd	0.230	0.239	0.231	0.227	0.225	0.228	0.225	0.228	0.223	0.225	0.224	0.231	0.224	0.232	0.223	0.246
No. of obs.	234	234	234	234	234	234	234	234	234	234	234	234	234	233	234	233

Columns 1 to 15:

$$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$$

Column 16:

$$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (all obstacles at once)}$$

Appendix 6: Estimating the binding constraint for Asian-owned MSMEs

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
finance	0.005															0.007
	0.401															0.294
land		0.008														0.011
		0.298														0.211
Licensing			-0.004													-0.008
			0.659													0.536
Corruption				0.000												-0.001
				0.975												0.914
Courts					-0.009											-0.012
					0.444											0.413
Crime						0.002										0.002
						0.731										0.723
Customs							-0.004									0.001
							0.678									0.920
Electricity								-0.005								-0.006
								0.315								0.348
Workers' educ.									0.002							0.006
									0.793							0.557
Labour										-0.007						-0.008
										0.332						0.333
Politic											-0.006					-0.005
											0.525					0.696
Practices												-0.018				-0.018
												0.006				0.012
Tax admin													0.013			0.010
													0.138			0.507
Tax rates														0.011		0.014
														0.158		0.263
Transport															-0.007	-0.002
															0.325	0.879
Std. Error	0.006	0.008	0.010	0.005	0.012	0.005	0.009	0.005	0.007	0.007	0.009	0.006	0.009	0.008	0.007	
R-squared	0.286	0.288	0.284	0.283	0.286	0.284	0.284	0.287	0.284	0.287	0.285	0.314	0.292	0.291	0.287	0.359
Adj. R-sqd	0.250	0.252	0.248	0.247	0.250	0.248	0.248	0.251	0.247	0.251	0.249	0.279	0.256	0.256	0.251	0.269
No. of obs.	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188	188

Columns 1 to 15:

$$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$$

Column 16:

$$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (all obstacles at once)}$$

Appendix 7: Estimating the binding constraint for Johannesburg-based MSMEs

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
finance	0.008															0.005
	0.031															0.224
land		0.007														0.005
		0.116														0.289
Licensing			0.013													0.008
			0.014													0.211
Corruption				0.001												0.001
				0.843												0.879
Courts					-0.008											-0.006
					0.224											0.401
Crime						-0.002										-0.003
						0.576										0.480
Customs							-0.013									-0.009
							0.126									0.345
Electricity								-0.008								-0.007
								0.018								0.045
Workers' educ.									0.004							0.005
									0.346							0.352
Labour										0.002						0.001
										0.735						0.825
Politic											0.004					-0.002
											0.581					0.760
Practices												-0.002				-0.004
												0.698				0.405
Tax admin													0.004			-0.001
													0.606			0.953
Tax rates														0.004		0.006
														0.488		0.316
Transport															0.000	-0.004
															0.976	0.520
Std. Error	0.004	0.004	0.005	0.004	0.006	0.003	0.008	0.003	0.005	0.005	0.007	0.004	0.007	0.005	0.005	
R-squared	0.363	0.359	0.365	0.355	0.358	0.356	0.359	0.365	0.357	0.355	0.356	0.354	0.355	0.356	0.355	0.387
Adj. R-sqd	0.348	0.344	0.350	0.340	0.342	0.340	0.344	0.349	0.341	0.340	0.340	0.339	0.340	0.341	0.340	0.348
No. of obs.	389	389	389	389	389	389	389	389	389	389	389	388	389	389	389	388

Columns 1 to 15:

$$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$$

Column 16:

$$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (all obstacles at once)}$$

Appendix 8: Estimating the binding constraint for retail sector MSMEs

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
finance	0.010															0.012
	0.161															0.133
land		0.012														0.018
		0.071														0.020
Licensing			-0.005													-0.022
			0.545													0.039
Corruption				0.013												0.006
				0.023												0.420
Courts					-0.010											-0.009
					0.440											0.532
Crime						0.009										0.006
						0.131										0.397
Customs							0.012									0.016
							0.290									0.247
Electricity								-0.008								-0.011
								0.223								0.138
Workers' educ.									0.004							-0.001
									0.612							0.930
Labour										-0.001						0.000
										0.952						0.969
Politic											0.006					0.001
											0.685					0.960
Practices												0.004				0.001
												0.592				0.894
Tax admin													0.008			-0.002
													0.499			0.899
Tax rates														0.011		0.020
														0.261		0.269
Transport															-0.008	-0.017
															0.286	0.085
Std. Error	0.007	0.007	0.008	0.006	0.013	0.006	0.011	0.007	0.008	0.009	0.016	0.007	0.011	0.010	0.008	
R-squared	0.230	0.236	0.222	0.245	0.223	0.232	0.226	0.228	0.222	0.220	0.221	0.221	0.223	0.227	0.226	0.322
Adj. R-sqd	0.186	0.193	0.178	0.202	0.179	0.188	0.182	0.184	0.177	0.176	0.177	0.176	0.178	0.182	0.182	0.213
No. of obs.	168	168	168	168	168	168	168	168	168	168	168	167	168	168	168	167

Columns 1 to 15:

$$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$$

Column 16:

$$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (all obstacles at once)}$$

Appendix 9: Estimating the binding constraint for male-owned enterprises

Obstacle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
finance	0.008															0.007	
	0.034															0.096	
land		0.014														0.017	
		0.000														0.000	
Licensing			-0.001													-0.009	
			0.872													0.106	
Corruption				0.003												0.002	
				0.320												0.540	
Courts					-0.013											-0.013	-0.011
					0.043											0.052	0.074
Crime						0.002										0.000	
						0.441										0.925	
Customs							-0.005									-0.005	
							0.371									0.445	
Electricity								-0.005								-0.007	-0.004
								0.114								0.039	0.250
Workers' educ.									0.002							0.000	
									0.596							0.967	
Labour										0.003						0.005	
										0.386						0.289	
Politic											0.007					0.006	
											0.230					0.397	
Practices												-0.001				-0.004	
												0.813				0.292	
Tax admin													0.005			-0.003	
													0.398			0.662	
Tax rates														0.011		0.013	
														0.017		0.024	
Transport															-0.006	-0.009	-0.003
															0.178	0.049	0.512
Std. Error	0.004	0.004	0.005	0.003	0.006	0.003	0.006	0.003	0.004	0.004	0.006	0.004	0.006	0.004	0.004		
R-squared	0.309	0.321	0.303	0.305	0.309	0.304	0.304	0.307	0.304	0.304	0.305	0.303	0.304	0.311	0.306	0.359	0.312
Adj. R-sqd	0.297	0.309	0.291	0.292	0.297	0.292	0.292	0.294	0.291	0.292	0.293	0.290	0.292	0.299	0.294	0.329	0.297
No. of obs.	527	527	527	527	527	527	527	527	527	527	527	526	527	526	527	525	527

Columns 1 to 15:

$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (one obstacle at a time)}$

Column 16:

$\text{Growth} = \beta_0 + \beta \log \text{of sales} + \beta \text{ number of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (all obstacles at once)}$

Column 17:

$\text{Growth} =$

$\beta_0 + \beta \log \text{of sales} + \beta \text{ no. of employees} + \beta \text{ number of employees squared} + \beta \text{ firm age} + \beta \text{ firm age squared} + \beta \text{ foreign ownership} + \beta \text{ export} + \beta \text{ (only significant from Column 2 to 16)}$